Specific Accreditation Criteria

ISO/IEC 17025 Application Document

Life Sciences - Annex

Asbestos sampling and testing

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Purpose

In addition to the *ISO/IEC 17025 Standard Application Document* (SAD) and the accompanying *Life Science - Appendix*, this document provides interpretative criteria and recommendations for both applicant and accredited facilities conducting asbestos sampling and/or testing in accordance with part A (Common criteria), part B (Determination of airborne fibre concentrations) and/or part C (Asbestos identification in bulk samples) of the annex.

Facilities must comply with all relevant documents in the NATA Accreditation Criteria (NAC) package for Environment (refer to *NATA Procedures for Accreditation).*

The clause numbers in this document follow those of ISO/IEC 17025, however, since not all clauses require interpretation, the numbering may not be consecutive.

Part A: Common criteria
5 Structural requirements

5.3

Field Sites

NATA allows the scope of accreditation of facilities undertaking work in accordance with part A, part B and/or part C of this Annex to include activities performed at a field site (laboratory). Such sites are temporary establishments (i.e. generally operate for less than 18 months and not with the intention of operating as permanent sites) under the control of the accredited facility (i.e. the base location).

Facilities are required to keep records of field sites established. NATA will request these records prior to arranging an assessment and assess such sites on a sampling basis when assessing the accredited facility.

The facility must ensure that a sample of personnel, the equipment, the procedures adopted, and all associated records are available for review during the NATA assessment.

The assessment of field sites is expected to be undertaken face to face, however, where appropriate, consideration will be given to the use of virtual technology(ies) where the work site is remote or access to the worksite will pose an unacceptable risk to the assessment team.

5.4

Field Sites

If a facility wishes to establish a field site for asbestos sampling and/or testing in a country other than Australia, it should first determine whether the Australian facility's NATA scope of accreditation will be accepted (e.g. with any local regulators). Further, as NATA is a signatory to the International Laboratory Accreditation Cooperation (ILAC) and the Asia Pacific Accreditation Cooperation (APAC) Mutual Recognition Agreements (MRAs), NATA is obligated to encourage facilities seeking accreditation in other countries to do so with the local signatory Accreditation Body if available.

A field site can be covered by the facility's NATA scope of accreditation if the following criteria are satisfied:

- be located on-site (or in very close proximity to) where the samples are to be collected for the duration of a project;
- be established to test only samples from a single project;
- be located in a suitable environment for testing, taking into consideration the need to ensure sample integrity and prevention of the dissemination of potential asbestos containing material;

  Note: Short term accommodation including hotel/motel rooms and similar forms of accommodation are not considered appropriate environments in which to undertake asbestos testing.

- operated by asbestos analysts who work out of the base facility.

The facility must have a documented procedure for the establishment of a field site(s) covering the following, but not limited to:

- accommodation and equipment setup;
- equipment maintenance;
- personnel and supervision arrangements;
- record maintenance.

6 Resource requirements

6.2 Personnel

6.2.1 The employment status of personnel is defined as whether the personnel member is directly employed (internal) by the accredited facility or is under the direct supervision (external) of the accredited facility for work covered by the scope of accreditation.

6.2.5 Where field sites have been established, supervisory visits by personnel located at the (base) facility must take place at least once per week. Personnel conducting these visits must be in a position of authority and approved to review sample collection, volume measurement, fibre counting and/or fibre identification. Such visits are not required where supervisory personnel are located at the field site for the duration of its operation. Records sufficiently detailed to identify what activities were performed during the supervisory visits must be kept.

6.2.6 Results of asbestos fibre counting and identification must be released by personnel approved by the facility as an asbestos analyst.

6.3 Facilities and environmental conditions

6.3.4 Precautions may need to be taken at field sites to define and control access to minimise the risk of exposure to personnel.

6.4 Equipment

6.4.3 The procedures for microscope set-up and other associated test activities must be documented and available to personnel at the facility and at any field site(s).

6.4.7 Facilities are responsible for establishing their own equipment assurance program to ensure consistent results are produced. Guidance on equipment assurance and calibration is available in Technical Papers published by the Australian Institute for Occupational Hygiene (AIOH).

6.4.13 Records of the specific equipment and the date(s) of use at field sites must be kept.

7 Process Requirements

7.2 Selection, verification and validation of methods

7.2.1 Selection and verification of methods

7.2.1.1 Accreditation for asbestos sampling and testing is offered for AS 4964, ISO 22262 series (Part 1; 2; 3) and other valid methods proposed by applicant and accredited facilities.

7.3 Sampling

7.3.1 Facilities may choose to be accredited for the development of sampling plans as a standalone activity if they are not involved in the testing aspects (whether this is for volume measurement and/or determination of asbestos concentration and/or asbestos identification).

When developing sampling plans, consideration should be given to the adoption of standard methods where available however, accreditation for the use of in-house methods may also be considered.

Note: Some examples of standard methods include ASTM E2356, D7201, E1368**.**

If an in-house method is adopted, validation records of the approach used must be available.

The assessment of sampling activities is expected to be undertaken face to face, however, where appropriate, consideration will be given to the use of virtual technology(ies) where the work site is remote or access to the worksite will pose an unacceptable risk to the assessment team.

Part B: Determination of airborne fibre concentrations

5 Structural requirements

5.3 The facility may only issue asbestos fibre concentration results under its scope of accreditation if it takes responsibility for the sample collection, including volume measurement (i.e. its scope of accreditation includes 'volume measurement') addressing all relevant accreditation criteria (e.g. personnel training and competency, equipment calibration and maintenance, etc.). This is regardless of the employment status of the personnel (refer to part A 6.2.1).

This responsibility requires the facility to confirm the placement of pumps in accordance with the documented sampling plan for a specific job and confirm that their set-up and use has been in accordance with the facility's procedure.

6 Resource requirements

6.2 Personnel

6.2.5 The facility must document the approval of personnel authorised to perform sample collection (volume measurement of air) and asbestos fibre counting.

Evidence of the competency of personnel for sample collection can include but is not limited to:

- use of pumps and flow measuring equipment including set-up, calibration and in-field pre and post sampling check;
- demonstrated competency for the placement of pumps in strategic locations dependent on the purpose for the specific job;
- demonstrated knowledge of the sampling procedure and other referenced methods in use by the facility, including information available from the AIOH Technical Papers related to airborne sampling equipment;
- demonstrated knowledge of any specific and relevant regulations.

Evidence of the competency of personnel for asbestos fibre counting can include but is not limited to:

- an evaluation of the theory of the methodology and satisfactory practical demonstration of fibre identification and counting;
- operation and maintenance of microscopes including Kohler illumination;

  Note: Other microscope related tasks can include but are not limited to the alignment of the phase ring with telescoping lens, resolution checks with traceable HSE/NPL test slide, and traceable micrometer slide etc.

- satisfactory results of internal quality control activities;
- participation and satisfactory performance in proficiency testing programs.

Where relevant and available, external courses which provide an understanding of volume measurement and estimating airborne asbestos fibre concentration should be considered.

The system for evaluation and monitoring of personnel approved to perform sample collection and counting of asbestos fibres must include activities for refresher training to be undertaken by personnel who have not performed the activity(ies) for extended periods, for example 3 months or greater. For asbestos counting, such refresher

training may include participation in internal quality control activities and external proficiency testing.

6.4 Equipment

6.4.1 Sampling pumps used in the collection of air for asbestos fibre counting must have a mechanism (e.g. fault light) to indicate flow interruption during the sampling period.

6.4.10 Immediately prior to and after cessation of the sampling activity, the flow rate of each sampling train must be checked using a suitably calibrated instrument in accordance with the requirements in part 8 of the NOHSC *Guidance note on the membrane filter method* (MFM) or other reference method. All pre and post flow measurements must be conducted in the field at the sampling site.

Pre-determined flow rates of sampling trains (e.g. flowrates which have not been measured immediately prior to and post sampling) must not be used to calculate sample volumes for the determination of fibre concentration.

7 Process Requirements

7.2 Selection, verification and validation of methods

7.2.1 Selection and verification of methods

7.2.1.1 The *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition* [NOHSC:3003 (2005)] which is published by Safe Work Australia, incorporates the following main activities:

- sample collection, involving in-field measurement of the volume of air sampled using calibrated equipment (e.g. sampling pumps and flow measuring equipment);
- volume measurement to occur in-field at the documented pump location, when samples are first placed and then again when collected;
- analysis of the samples using phase contrast microscopy (i.e. counting fibres using appropriate equipment, sizing of the fibres using a calibrated eyepiece graticule and calibrated effective filter area).

Where another method is used the requirements of ISO/IEC 17025 clause 7.2 apply.

7.2.1.2 A copy of the method used, and a copy of all associated facility documentation must be kept at the base facility and at each field site.

7.3 Sampling

7.3.1 The placement of air sampling pumps in the field is critical and dependent on the development and application of appropriate sampling plans. For facilities accredited for volume measurement, the development of sampling plans will be reviewed as part of the assessment.

7.5 Technical records

7.5.1 Records must include the individual fibre count for each field examined.

7.7 Ensuring the validity of results

7.7.1 Internal quality control (QC) must cover all personnel, including those performing activities at any field sites.

QC activities should include the use of a blind-counting set of reference slides and recounts of routine slides. The reference slides must contain greater than approximately 10 fibres per 100 graticule fields (i.e. be statistically countable).

The facility must establish limits on the number of samples to be examined by an asbestos analyst in a specified period. These limits will be influenced by the number of difficult slides being counted.

Note: It is considered that 12 'average' samples per day is reasonable, but this limit can be in the range of 10 to 20 per day).

Field blanks and analytical blanks must be used. Field blanks are to be used at a minimum frequency of 1, for up to every 50 filters used, per air monitoring shift per site. The same field blank cannot be used for multiple shifts or multiple sites. For analytical blanks, for each batch of 100 filters analysed, 1 unused filter must be selected.

7.7.2 Facilities must participate in a proficiency testing (PT) program for asbestos fibre counting. A program for participation of all asbestos analysts must be established to ensure that each participates in the proficiency program over a defined period.

7.8 Reporting of results

7.8.2 Common requirements for reports (test, calibration or sampling)

7.8.2.1 Reports, including preliminary reports, must include the name of the asbestos analyst and the person who undertook the volume measurement.

A facility which does not hold accreditation for volume measurement must not make any claim implying that accreditation is held for such an activity. For further information, refer to the *General Accreditation Criteria: Use of the NATA emblem, NATA endorsement and references*.

7.8.3 Specific requirements for test reports

7.8.3.1 Test reports for airborne fibre concentrations must be issued in accordance with the test method requirements.

Test reports for asbestos fibre counting must include the results reported as 'x' fibres per 'y' fields.

Where the facility is not accredited for volume measurement, results cannot be reported as fibres per millilitre.

Facilities must have prepared the slides used to obtain the results included in the report.

Reports for estimation of airborne respirable asbestos fibres performed for WHS regulatory purposes must include reference to the applicable regulatory requirement.

Results of work undertaken at a field site must identify the location of that field site.

Where a facility is accredited only for volume measurement, the following information must be reported to the facility undertaking the fibre counting analytical work:

- start and finish times for the pump(s) used to collect the sample(s);
- initial and final flow rates of the pump(s) used to collect the sample(s);
- volume of air sampled;
- measurement uncertainty for the volume of air collected.

Part C: Asbestos identification in bulk samples

6 Resource requirements

6.2 Personnel

6.2.5 Facilities must document the approval of appropriate personnel authorised to perform asbestos fibre identification.

Evidence of personnel competency can include but is not limited to:

- an evaluation of the knowledge of the testing undertaken and the theory upon which this testing is based;
- satisfactory results of internal quality control activities;
- participation and satisfactory performance in proficiency programs.

The system for evaluation and monitoring of personnel approved to identify asbestos fibres must include activities for refresher training to be undertaken by personnel who have not performed the activity(ies) for extended periods, for example 3 months or greater. For asbestos fibre identification, such refresher training may include participation in internal quality control activities and external proficiency testing.

7 Process Requirements

7.2 Selection, verification and validation of methods

7.2.1 Selection and verification of methods

7.2.1.1 The test method(s) used must:

- differentiate between asbestos fibres and the non-fibrous parent material;
- apply to both homogeneous and non-homogeneous matter;
- be able to identify all fibre type(s) present as per the standard method(s) for which accreditation is/are held;
- be able to determine the presence of synthetic mineral fibres (SMF) and organic fibres;
- include the reporting limits, which have been established as part of the method's validation.

A suitable method that conforms with the points described above and that uses polarised light microscopy with dispersion staining, is described in various standard methods and/or publications including:

- AS 4964: *Method for the qualitative identification of asbestos in bulk samples*;
- ISO 22262-1 *Air quality - Bulk materials - Part 1: Sampling and qualitative determination of asbestos in commercial bulk materials;*
- ISO 22262- 2: *Air quality — Bulk materials — Part 2: Quantitative determination of asbestos by gravimetric and microscopical methods;*
- Health and Safety Executive (HSE), HSG248, *Asbestos: The analysts' guide for sampling, analysis and clearance procedures (2005) Appendix 2: Asbestos in bulk materials: Sampling and identification by polarised light microscopy (PLM).*

The methodology of AS 4964 is based on an implicit, mandatory requirement for non-asbestos and non-mineral fibres (such as SMF and organic fibres if present) to

be analysed and identified. The method is invalid when these types of fibres are present and not able to be formally identified.

Any supporting work instruction/procedure, to ensure consistent application of a standard method, is to include appropriate definitions of SMF and organic fibres and the criteria to be applied for identification of these.

An adequate definition of SMF is any fibre exhibiting isotropic optical characteristics. This group includes glass fibres, glass wool, rock wool, slag wool, ceramic fibres, and 'bio-soluble' fibres of all types.

Organic fibres can be defined as fibres which ash at approximately 400±30°C. These include natural organic fibres such as cellulose, hemp, cotton, flax, jute and wool and man-made organic fibres such as polypropylene, polyester, nylon, kevlar and acrylics.

It should be noted that SMF and organic fibres are only to be described in generic terms (i.e. fibres such as glass fibres, ceramic fibres, wool fibres, cotton fibres and so on, are not to be analysed or reported).

7.2.2 Validation of methods

If accreditation is sought for the identification of actinolite, anthophyllite and tremolite asbestos, a fully validated method including limits of detection must be available. ISO 22262 part 2 and/or part 3 and HSE HSG248 meet these requirements.

Note: AS 4964 does not support the reporting of actinolite, anthophyllite and tremolite without an additional independent confirmatory testing technique such as infrared spectroscopy, X-ray diffraction, scanning electron microscopy or transmission electron microscopy.

7.3 Sampling

7.3.1 Where the facility is responsible for sampling activities, the development and application of appropriate sampling plans is required. Samples collected must be representative of the bulk material from the whole area being sampled.

7.4 Handling of test or calibration items

7.4.1 In general, the facility should not subsample non-homogeneous samples because of the high probability that small amounts of asbestos materials may be unintentionally omitted due to the sampling process. However, where subsampling is performed:

- a validated method shall be used;
- an appropriate qualifying statement is to be included in the test report advising customers of the potential for invalid results;
- the subsampling method must be referenced in the test report.

7.5 Technical records

7.5.1 Records must include all original data and observations, so that the conclusions as to the identification of fibres can be checked.

7.7 Ensuring the validity of results

7.7.1 Internal quality control (QC) activities must cover all personnel, including those performing activities at any field sites.

QC activities should include the use of samples covering asbestos types covered by the scope of accreditation, including synthetic mineral fibres and organic fibres and recounts of routine slides.

7.7.2 Facilities must participate in a proficiency testing (PT) program for the sample matrices covered by the scope of accreditation. A program for participation of all asbestos analysts must be established to ensure that each participates in the proficiency program over a defined period.

Note: The definition of sample matrices is that described in the standard method used.

7.8 Reporting of results

7.8.2 Common requirements for reports (test, calibration or sampling)

7.8.2.1 Reports, including preliminary reports, must include the name of the asbestos analyst.

7.8.3 Specific requirements for test reports

7.8.3.1 Facilities must have prepared the samples used to obtain the results included in reports.

Where a method requires additional in-house methodology, such as AS 4964 or HSE HSG248, reference to the in-house method must be included in the report.

Reports must specify the type(s) of asbestos detected (i.e. actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite).

If identification is not possible due to adhering resins or cements, or because of degradation of the fibres, an explanatory note to that effect must be included on the report.

Quantitative estimates of asbestos % content in homogeneous and non-homogeneous samples shall not be included in reports unless included in the standard method used.

Results of work undertaken at a field site must identify the location of that field site.

Reported details of sample history, including size and/or weight and position in relation to the area from which it was taken, when known, must provide sufficient information to ensure that results can be correctly interpreted.

Where AS 4964 is used, analysis and reporting of non-homogeneous samples, including but not limited to soils and dusts, shall:

- be in accordance with sections 9.4 and 9.5;
- the detection limit be in accordance with section 8.4 including note 7;
- not include presence / absence criteria.

AS 4964 requires the test report to include a factual description (e.g. form, dimensions and/or weight) of the asbestos fibres present.

References

This section lists publications referenced in this document. The year of publication and edition is not included as it is expected that only current versions of the references shall be used.

Standards

AS 4964 *Method for the qualitative identification of asbestos in bulk samples*

HSE HSG248 *Asbestos: The analysts' guide for sampling, analysis and clearance procedures (2005) Appendix 2: Asbestos in bulk materials: Sampling and identification by polarised light microscopy (PLM)*

ISO/IEC 17025 *General requirements for the competence of testing and calibration laboratories*

ISO 22262-1 *Air quality - Bulk materials - Part 1: Sampling and qualitative determination of asbestos in commercial bulk materials*

ISO 22262-2 *Air quality - Bulk materials - Part 2: Quantitative determination of asbestos by gravimetric and microscopical methods*

ISO 22262-3 *Air quality - Bulk materials - Part 3: Quantitative determination of asbestos by X-ray diffraction method*

NOHSC *Guidance note on the membrane filter method for estimating airborne asbestos fibres*

NATA Publications

General Accreditation Criteria: Use of the NATA emblem, NATA endorsement and references to accreditation

NATA Accreditation Criteria (NAC) package for Environment

Other Publications

Australian Institute for Occupational Hygiene, Technical Papers (https://www.aioh.org.au/resources/technical-papers)

Amendment Table

The table below provides a summary of changes made to the document with this issue.

Section or Clause	Amendment
7.7.1	Part B Criteria clarified mandating the use of field and analytical blanks.
7.8.3.1	Part B The term ‘supplementary work instruction’ has been replaced with in-house methodology.
7.8.3.1	Part C The term ‘supplementary work instruction’ has been replaced with in-house methodology or in-house method.