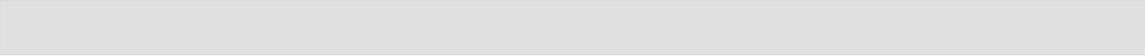




# **Chemical Testing ISO/IEC 17025 Application Document**

## **Annex B: Asbestos fibre counting**

**May 2014**



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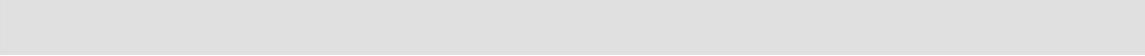
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## Chemical Testing Annex B: Asbestos fibre counting

This document provides additional interpretative criteria and recommendations for the application of ISO/IEC 17025 in the field of Chemical Testing for both applicant and accredited facilities conducting the counting of asbestos in bulk samples.

Applicant and accredited facilities must also comply with the ISO/IEC 17025 standard and Chemical Testing field application documents and any field annexes, policies and/or technical circulars (refer to NATA Procedures for Accreditation).

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

### **4.13 Control of records**

#### **4.13.2 Technical records**

##### **4.13.2.1 General**

Records must include the individual count for each field examined. When fields are blank it is acceptable to keep a mental tally of up to ten 'blank' fields before an entry is made on the count sheet (e.g. by drawing a line through the ten fields). Where a verified mechanical counter is used the 10 field requirement does not apply.

### **5.2 Personnel**

Facilities must document a policy or procedure for the approval of appropriate staff authorised to perform asbestos fibre counting. NATA will take a sampling approach to review the competency of asbestos counters at assessments.

#### **5.2.1 Approved counters**

NATA will no longer formally recognise staff as approved counters in the field of Chemical Testing unless a requirement exists under a regulatory framework or is covered by a Deed of Agreement, Memorandum of Understanding or other binding agreement with a third party. This decision effectively shifts the responsibility of asbestos counter approval from NATA to the facility management.

The facility must maintain a list of staff authorised as asbestos counters.

Where regulatory frameworks exist facilities may request the addition of asbestos counters to their scope of accreditation as long as they provide the policy and procedure for approval of asbestos counters (if not already reviewed by NATA) and the records showing how the competencies were met.

Evidence of competency can include but is not limited to:

- Records of the approval of staff to count asbestos including an evaluation of the knowledge of the testing undertaken and the theory upon which this testing is based.
- Results of participation in the facility's quality control program
- Participation in external proficiency programs

The facility must have a system in place for evaluating and monitoring the continued competency of asbestos counters. The system must include the activities or refresher training to be undertaken by staff who have been absent for extended periods, for example 3 months or greater. Such activities may include participation in an internal quality assurance (QA) program and external proficiency testing.

These evaluations must be undertaken by another competent person.

### **Person approved to authorise results**

A person approved to release results must be an asbestos counter or where they hold a more senior position at the facility they must be able to demonstrate extensive experience as an asbestos counter and be familiar with the day to day operation of the facility.

### **5.2.3 Third parties conducting volume measurement**

Third parties can conduct the sample collection for asbestos fibres in air, leading to the issue of an endorsed report including a concentration, as long as the following requirements are met by the accredited facility:

- A formal training (and retraining) program for each third party staff member is conducted, including practical and theoretical exams;
- The name of the third party (person and their company) is included on test reports;
- A note is included on test reports stating that trained third parties did the volume measurement and that the facility is responsible for the data.

## **5.3 Accommodation and environmental conditions**

### **5.3.1 Field sites**

To qualify as a field laboratory an operation must satisfy the following three criteria:

- a) It must be established to service one specific project with a finite period of no more than 18 months, not several non-specific ones.
- b) It must be on the site of (or in very close proximity to) the project it is servicing.

- c) It must be staffed by asbestos counters who work out of the base facility.

If the operation does not meet all of these criteria, a separate accreditation must be obtained.

Each facility must have documented procedures to be applied when setting up a field laboratory.

The field site must be visited at least once per week by a staff member who is experienced in the total asbestos testing process from sample collection to issue of results, if they are not located at the field site for the duration of its operation. Records sufficiently detailed to identify what activities were undertaken must be kept of these visits.

NATA must be notified in writing of any field laboratory that operates for longer than two months. NATA reserves the right to assess any long term field laboratory, either as part of the assessment of the base facility or as a separate exercise.

A copy of the National Occupational Health and Safety Commission Guidance Note on the membrane filter method for estimating airborne asbestos and a copy of all associated facility documentation must be kept in each field laboratory.

#### **5.3.4 Access to field sites**

Special precautions may need to be taken at field sites to define and control access.

### **5.4 Test and calibration methods and method validation**

#### **5.4.2 Selection of methods**

The method to be used as the basis of the facility's procedures is that set out in the National Occupational Health and Safety Commission Guidance Note. At least one copy of this document must be available at the facility and in any field laboratory.

**5.4.6.2** Assistance in determining an estimation of measurement uncertainty is provided in the National Occupational Health and Safety Commission Guidance Note.

The facility's procedures for microscope set-up and other associated test activities must be documented, and available in the facility and any field laboratory.

## 5.5 Equipment

### 5.5.1

Sampling pumps must have a mechanism (e.g. fault light or automatic facility to stop the pump) to indicate flow interruption during the sampling period.

### 5.5.2 Common equipment Checks

#### a. Calibration of equipment for asbestos counting

Facilities are responsible for establishing their own equipment assurance program. This is to ensure that all equipment used satisfies the need to produce consistent results. Where such a program is not established, then the requirements for calibrations and checks are as detailed in the following table

Item of equipment	Maximum period between successive calibrations (years)	Maximum period between checks (months)	Procedures and comments
Effective Filter Area		On commissioning and whenever the filter, filter holder or any aspect of the filter clearing is changed.	NOHSC Guidance Note: 3003
Manual soap film flow meter		On commissioning	Check volume using an appropriate measuring device.
Microscope	Yearly service		Details at end of table.
		Regular cleaning	The microscope, lenses and objectives must be kept clean.
		On use	The HSE/NPL test slide is used when setting up the microscope prior to counting each batch of slides. . Only slides with the 5 <sup>th</sup> set of lines fully visible and the 6 <sup>th</sup> set partially visible are suitable. Use of slide to be recorded.

Item of equipment	Maximum period between successive calibrations (years)	Maximum period between checks (months)	Procedures and comments
		<p>Measured on installation then every 12 months and whenever the interpupillary distance, objective, intermediate magnification, or, on some microscopes, the eyepieces are changed.</p> <p><b>Note:</b> For microscopes embodying a magnification change, the graticule must be measured prior to counting each batch of slides.</p>	<p>Walton-Beckett graticule as per NOHSC Guidance Note No: 3003</p>
<p><b>Pumps</b> (Where accreditation is held/sought for volume measurement)</p>			
<p>Direct automatic flow-control</p>		<p>After 2 consecutive tests, each 12 months apart (ie. 1 year), showing results within <math>\pm 5\%</math> of the expected result, the interval can be lengthened to 3 years.</p>	<p>Constant flow compensation. Refer to Chemical Testing Annex K: Workplace pump calibration checks.</p>

Item of equipment	Maximum period between successive calibrations (years)	Maximum period between checks (months)	Procedures and comments
Indirect automatic flow-control		After 3 consecutive tests, each 6 months apart (ie. 1 year), showing results within $\pm 5\%$ of the expected result, the interval can be lengthened to 12 months	As above.
All pumps		On use	Where accreditation for volume measurement is held, the flow rate must be checked in the field before and after use.
		Regular maintenance and battery checks	Records must be kept.
<b>Rotameters</b>			
Small bore, long flow meter, spherical float		Initial, then every 12	Over the range of use (including high flow rates where used). If the difference between indicated and 'true' flow rate exceeds $\pm 3\%$ , then the indicated flowrate must be corrected.
Large bore, short/medium flow meter, cylindrical float.		Initial, then every 24	Over the range of use (including high flow rates where used). If the difference between indicated and 'true' flow rate exceeds $\pm 3\%$ , then the indicated flowrate must be corrected.
Electronic soap film-like flow meter (eg. <i>Gilibrator, Mini-buck</i> )		Monthly for 3 months then, if measurements are within $\pm 3\%$ of the expected result, the interval can be lengthened to 6 months.	Over the range of use (including high flow rates where used).
Positive Displacement Meters	2		

## **b. Servicing of microscopes**

The correct functioning and operation of microscopes must be assured. This may be achieved through annual servicing and undertaking the activities outlined below.

### **Phase contrast microscopes**

- Check, lubricate (as necessary) and adjust all mechanical moving parts, such as condenser rack, stage controls and field diaphragm.
- Check all optical alignments such as oculars, objectives, binocular tube, condenser and illumination system for surface and mount defects.
- Clean all optical components as necessary.
- Check for vertical, horizontal and rotational displacement of images in binocular tube. If any observable vertical displacement of the image is detected, the microscope must be removed from use and corrected before being placed back into service.

## **c Workplace pump calibration**

The correct functioning and operation of pumps and associated timers must be assured. Facilities are responsible for establishing an appropriate assurance program. Where such a program has not been established the requirements are as detailed below.

### **i. Indirect automatic flow-control pumps**

Before being placed into service, after six months, and then after a further six months, the following tests must be done on every indirect automatic flow-control pump used by the facility.

- a) For 25mm diameter membrane filters (e.g. 0.8µm pore size, mixed esters of cellulose). Test each pump at each flow rate that is used. For example, if the pump is used at 1.0, 2.0 and 4.0 litres/minute, then it must be tested at 1.0, 2.0 and 4.0 litres/minute.
- b) Set the pump flow rate to the chosen flow rate using a flow meter. No other flow resistance should be in the circuit.
- c) By inserting an adjustable or specially chosen flow resistance, select the resistance so that the pressure drop equals or exceeds approximately 2 kPa for each one litre/minute flow rate. (For example, for 4 litres/minute, the pressure drop must be 8 kPa or greater). This pressure drop can be determined by using devices such as a simple 'U' tube water manometer or a Magnehelic differential pressure gauge.
- d) Without adjusting the pump, re-measure the flow rate.
- e) If the flow rate changes by more than 5%, the pump's constant flow compensation must be reset.
- f) Repeat steps a) to e) with the pump set to each relevant flow rate.

- g) If the above tests produce results inside the  $\pm 5\%$  range for tests on three consecutive occasions, i.e. 12 months, then future tests need only be done at twelve-monthly intervals.
- h) If any internal components of the pumps have been serviced or changed, the test must be repeated before the pump is placed back into service and must meet the requirements of section g) above before going on to a 12 monthly calibration interval. Pumps that have the circuit board flow compensation potentiometers accessible must not be used until the access is blocked so as to prevent accidental adjustment.
- i) Some manufacturers of indirect automatic flow control pumps specify that flow rates of 1.0 and 2.5 litres/minute are to be used when electronically adjusting for correct 'constant flow compensation'. This should not be confused with the mandatory requirements stated in paragraph (a) above, where pump testing is to be done at every flow rate used.
- j) For pumps using 13mm diameter filters, conduct the same tests as for the pumps using 25mm diameter filters, except to apply a pressure drop criteria of 10kPa for each 1 litre/minute of flowrate. This takes into account the fact that a 13mm diameter filter has an effective filter diameter (i.e. dust deposit area) 5 times smaller than that of the effective filter area of a 25mm diameter filter and, therefore, a pressure drop 5 times larger.

## **ii. Direct automatic flow control pumps**

- a) Before any 'direct' automatic flow control pump is placed into service, and after a twelve month period, the tests as described in section 1 above (with the exception of paragraphs g) and i)), must be conducted on every direct automatic flow control pump used in the facility.
- b) If any internal components of the pumps have been serviced or changed, the test must be repeated before the pump is placed back into service.
- c) If these tests produce results inside the  $\pm 5\%$  range after two consecutive tests (i.e. one year), then future tests need only be done at three yearly intervals.

## **iii. Automatic pump timers**

The above mentioned calibration procedures must be adhered to for automatic pump timers.

In addition to these requirements, the following aspects must also be demonstrated to check that automatic pump timers:

- a) reliably deliver the correct flow rate immediately after automatic switch-on
  - i) set pump at initial 'nominal' flow rate
  - ii) program pump to start at least 1 hour later
  - iii) measure and record pump flow rate within 5 minutes of auto switch-on
  - iv) repeat steps i to iii for each flow rate used
  - v) repeat steps i to iv for each pump used
  - vi) repeat steps i to v on three separate occasions

- vii) accept a pump if any flow rate is within +/-5% of initial 'nominal' reading
  - viii) reject a pump if any flow rate is more than +/-5% of initial 'nominal' reading.
- b) reliably deliver the correct flow rate immediately before automatic switch-off over the time cycle chosen
- i) set pump at initial 'nominal' flow rate
  - ii) program pumps to finish at least 1 hour later
  - iii) measure and record 'final' pump flow rate within 5 minutes before auto switch-off
  - iv) repeat steps i to iii for each flow rate used
  - v) repeat steps i to iv for each pump used
  - vi) repeat steps i to v on three separate occasions
  - vii) accept a pump if any 'final' flow rate is within +/-5% of initial 'nominal' reading
  - viii) reject a pump if any flow rate is more than +/-5% of initial 'nominal' reading
- c) reliably display the sample duration to +/-1% or better
- i) time in-built pump timer over a typical sampling period and record timer's 'elapsed time'
  - ii) repeat step i for each sampling period likely to be used
  - iii) repeat steps i to ii for each pump used
  - iv) repeat steps i to iii on three separate occasions
  - v) accept a pump if pump timer elapsed time is within +/-1% of actual elapsed time.
- d) reliably switch off automatically in the event of a flow fault such that the final flow rate is within  $\pm 10\%$  of the initial flow rate
- i) set pump at initial 'nominal' flow rate
  - ii) progressively restrict pump suction so as to cause 'flow fault' condition
  - iii) during step ii measure and record pump flow rate just before auto switch-off
  - iv) repeat steps i to iii for each flow rate used
  - v) repeat steps i to iv for each pump used
  - vi) repeat steps i to v on three consecutive occasions
  - vii) accept a pump if final flow rate is within  $\pm 10\%$  of initial 'nominal' reading
  - viii) reject a pump if any final flow rate is more than  $\pm 10\%$  of initial 'nominal' reading
- e) reliably switch off automatically in the event of a low battery such that the final flow rate is within +/-10% of the initial flow rate.
- i) set pump at initial 'nominal' flow rate

- ii) progressively reduce voltage supply to pump so as to cause 'low battery' fault
- iii) during step ii, measure and record pump flow rate just before auto switch-off
- iv) repeat steps i to iii for each flow rate used
- v) repeat steps i to iv for each pump used
- vi) repeat steps i to v on three consecutive occasions
- vii) accept a pump if final flow rate is within +/-10% of initial 'nominal' reading
- viii) reject a pump if any final flow rate is more than +/-10% of initial 'nominal' reading.

Each pump must be tested and records kept of all of the aspects described above.

If the tests described under d) and e) above have not been done, any sample subject to automatic switch-off due to a flow fault or low battery must be rejected.

A facility can submit to NATA for review an alternative series of tests to those described above, provided that they achieve the same aim. One alternative may be the measurement of air volumes actually sucked by a pump during automatic operation. The test procedures for any alternative would need to be described in detail.

#### **5.5.5 Field site equipment**

Records must be kept of the location of each microscope used outside the base facility, and the dates on which it was at each site.

All microscopes used in field laboratories must be available for inspection during assessments of the base facility.

### **5.7 Sampling**

#### **5.7.1 Collection of samples**

Where volume measurement is undertaken by a sub contractor selected by the accredited facility, the accredited facility must ensure that the subcontractor meets the requirements of the clause 5.7 of the Chemical Testing Application Document.

### **5.9 Assuring the quality of test and calibration results**

Facilities must participate in a proficiency testing program for asbestos fibre counting. A program for participation of asbestos counters must be established to ensure that all counters participate in the proficiency program over a defined period.

Where unsatisfactory results are returned the facility must investigate and identify the cause(s) of this and establish a corrective action.

An adequate internal quality control program must also be in place and must cover all staff, including those involved in any field laboratories. These activities should include the use of a program for blind-counting a set of reference slides and recounts of routine slides. The reference slides must contain greater than approximately 10 fibres per 100 graticule fields (ie be statistically countable). Acceptance and rejection criteria for QC results must be developed and documented.

In addition, the facility must establish limits on the number of slides to be counted by a counter in a specified period. These limits will be influenced by the number of difficult slides being counted. (It is considered that 12 'average' slides per day is reasonable, but this limit can be in the range of 10 to 20 per day).

Field blanks, as described in section 8.2 of the National Occupational Health and Safety Commission Guidance Note, must be used. It is suggested that analytical blanks, as also described in section 8.2 of the National Occupational Health and Safety Commission Guidance Note, be used.

## **5.10 Reporting the results**

### **5.10.1 General**

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

Only when a facility is accredited for volume measurement (sub-class of tests 7.82.81), has been fully responsible for the collection of the sample, and has applied all volume measurement requirements to the sample collection, can results be reported as 'z' fibres per mL of air. The notation 'NATA accreditation does not cover the performance of this service' shall be included on the report with respect to the volume measurement when any or all of these circumstances do not apply.

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

Authorisation of reports, including preliminary reports, must include the name of the counter and the name of person authorised to release results.

**5.10.2e** Reports on asbestos counting work performed for regulatory purposes, must include reference to the NOHSC Membrane Filter Method (MFM) and any supplementary facility work instruction used to ensure consistent application of the MFM.

## **References**

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

## **Standards**

NOHSC:3003 Guidance note on the membrane filter method for estimating airborne asbestos fibres 2<sup>nd</sup> Edition

## AMENDMENTS

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

Section	Clause	Amendment
Approved counters	5.2.1	<p>Facilities must document a policy and procedure for the approval of appropriate staff to perform asbestos counting.</p> <p>The facility must maintain a list of staff authorised as asbestos counters.</p> <p>The facility must have in place a system for monitoring the continued competency of asbestos counters. The system must include the activities for refresher training to be undertaken by staff who have been absent for extended periods.</p> <p>A person approved to release results must be an asbestos counter or where they hold a more senior position at the facility they must be able to demonstrate extensive experience in counting and be familiar with the day to day operations of the facility.</p>
Third parties conducting volume measurement	5.2.1	Removed the requirements for written approval from NATA.
Field sites	5.3.1	<p>a) It must be established to service one specific project with a finite period of no more than 18 months.</p> <p>Discontinuation of the need to seek accreditation for field sites.</p>
Common equipment checks	5.5.2	Included paragraph that calibration intervals are guidelines only.
	a. and b.	Removed equipment not relevant to asbestos counting.
Assuring the quality of test and calibration results	5.9	Requirement for facilities to develop their own proficiency and internal quality control program.