

# **specific criteria for accreditation**

Wool Testing

8

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### AS LAB C 8

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## 1 Introduction

International Accreditation New Zealand (IANZ) Specific Criteria amplify or specialise the IANZ general criteria for particular areas of technology.

This document must be read together with current issues of the IANZ general criteria for accreditation NZS ISO/IEC 17025 (ISO 17025 hereafter), *General requirements for the competence of testing and calibration laboratories*, and the IANZ publication *Procedures and Conditions of Accreditation*, the latter document describing the organisation and operation of the IANZ Laboratory Accreditation Programme.

This criteria document provides information on classes of test (Appendix 1), staff, accommodation, equipment and other aspects of good laboratory management practice which are considered a minimum standard for wool testing laboratories being accredited against ISO 17025.

A separate document, AS LAB C8.1, provides supplementary criteria for wool sampling.

A list of all published criteria is available from IANZ on request. A selection of documents is also available on the IANZ website at [www.ianz.govt.nz](http://www.ianz.govt.nz).

## 2 Scope

The programme for accreditation of wool testing laboratories in New Zealand was developed by the National Council of New Zealand Wool Interests Incorporated and International Accreditation New Zealand in 1990.

These criteria for accreditation are based on recommendations of the Technical Committee of the National Council of New Zealand Wool Interests Incorporated along with the IANZ general criteria for accreditation. They are consistent with ISO 17025.

The Licensing Panel of the International Wool Textile Organisation (IWTO) has specified that test houses that wish to issue test certificates carrying the IWTO logo must be accredited to ISO 17025 by a national accreditation body for both test methods and applicable sampling regulations before they can be licensed by IWTO. From time to time the Licensing Panel also issues clarifications or additional requirements that test houses must meet before they can be licensed.

The surveillance and reassessment programme for wool testing laboratories comprises a full reassessment annually for the main laboratory with a six monthly surveillance in between. Branch laboratories are assessed once every two years with approximately half assessed each year.

## 3 Definitions

### 3.1 Calibration

The alignment of measurements on instruments, equipment or processes with established references or standard values.

### 3.2 Delivery

A bulk of raw wool covered by a single IWTO Test Certificate. If previously untested, all bales are sampled and tested as a group. If the component lots have been tested individually, the test results may be combined according to IWTO-31.

### 3.3 Greasy Wool

Wool from the sheep's back or sheepskins which has not been scoured, solvent degreased, carbonised or otherwise processed.

### **3.4 Integrity of a sample**

The maintenance of the identity and validity of the sample as representative of the lot, scourment or delivery.

### **3.5 IWTO**

The International Wool Textile Organisation is a body representing the interests of the world's wool textile trade and industry with membership on a national basis. IWTO covers standards for wool testing, terms of contract and arbitration, and is a forum for the international wool textile trade and industry.

### **3.6 OMI**

An Objectively Matched Interlot is a lot of raw wool containing individually tested Classed Grower Lots and one individually tested Interlot comprising a maximum of four single bale Classed Grower Lots, matched after testing and certified only as agreed by IWTO and in accordance with the specific national restrictions, the wool being from one country of origin.

### **3.7 Raw Wool**

Wool fibre together with variable amounts of vegetable matter and extraneous alkali-insoluble substances, mineral matter, wool waxes, suint and moisture. It includes:

- (a) Greasy wool
- (b) Wool which has been scoured, carbonised, washed, or solvent degreased
- (c) Scoured skin wools, and
- (d) Slupe wools.

### **3.8 Accredited Laboratory**

A laboratory which undertakes testing and related services in accordance with the requirements of approved methods and IANZ criteria and which has been accredited by IANZ. An accredited laboratory may issue IANZ endorsed test documents in accordance with its scope of accreditation.

### **3.9 Sample**

The combined grab samples representative of the wool in the sale lot; also, the wool drawn by appropriate methods from a lot, bulk or delivery.

In order to issue IWTO Test Certificates, the sample must be drawn in strict accordance with the relevant IWTO Test Regulations to ensure that it is representative.

### **3.10 Scoured Wool**

Greasy or slupe wools that have been commercially scoured, carbonised or solvent degreased, excluding washed and partly washed wools.

### **3.11 Scope of Accreditation**

The schedule of tests or types of tests for which IANZ has granted accreditation and for which the laboratory may issue IANZ endorsed test documents.

### **3.12 Test House**

A laboratory which carries out tests in accordance with the current IWTO Specifications and Regulations. In order to issue IWTO Test Certificates the laboratory must be a licensed laboratory. For the purposes of this criteria document the terms "test house" and "laboratory" can be considered equivalent.

### **3.13 Test Report**

Where the sampling or test procedure does not comply with international or national regulations or test methods, a certificate must not be issued and the test house may only issue its test results in the form of a Test Report.

### **3.14 Test Results**

A result which is obtained by applying a standard test method to a sample obtained in accordance with a standard sampling method and is:

- (a) Shown on a Test Certificate
- (b) Issued by a Test House, or
- (c) A component of a Combined Certificate.

## **4 Classes of Test/Scope of Accreditation**

IANZ accreditation does not constitute a blanket approval of all a laboratory's activities. Therefore, it is necessary to identify those activities for which competence has been demonstrated and accreditation granted.

Accreditation is normally granted only for work that is performed regularly.

Classes of test appropriate to wool testing laboratories are listed in Appendix 1. These classes are an arbitrary subdivision of the potential range of activities involved in wool testing laboratories on the basis of the types of samples being tested, the scientific disciplines involved, and the test methods employed. The range of activities can be extended at any time.

## **5 Laboratory Accommodation and Safety Requirements (ISO 17025 - clause 5.3)**

### **5.1 Accommodation**

The accommodation requirements for wool testing laboratories are extensive and onerous. Control of accommodation and environmental effects on samples must include precautions to prevent contamination, degradation and tampering and retain sample integrity.

Formal laboratory areas are required for many of the measurements such as fibre diameter, length properties, colour and vegetable matter dissection. The preparation and processing of samples for wool base, vegetable matter and length and diameter properties also requires extensive space and specialist equipment which is detailed in each method.

Significant space is also required for sample receipt and identification and for storage of keeper samples for possible retesting.

Laboratory areas where measurements are being made must have good lighting, adequate bench space, freedom from excessive dust and fumes, freedom from unwanted vibration and acoustic noise, and for many wool tests, control of temperature and humidity. Where the standard test methods require maintenance of specified conditions, records must be kept. The following are important:

- (a) Isolation from sources of mechanical vibration and shock likely to have a detrimental effect on sensitive instruments (e.g. high accuracy balances)
- (b) Adequate ventilation when fumes are created by the tests such as in caustic reduction and ashing
- (c) Temperature and humidity control of laboratories as specified in the relevant test procedure (e.g. 20 °C ± 2 °C, 65 % ± 3 % RH). Monitoring equipment for such conditions must be calibrated in accordance with the schedules in Appendix 3
- (d) Protection from excessive levels of light, dirt and dust (e.g. colour testing)
- (e) Isolation from sources of electromagnetic radiation
- (f) Protection from power surges.

### **5.2 Safety**

A number of activities that take place in wool testing laboratories involve hazards. These include the caustic reduction of wool to isolate vegetable matter, ovens and furnaces, handling and use of various chemicals and the use of some machinery such as Shirleys and scours.

The Health and Safety in Employment Act (HSE Act) places specific legal obligations on all employers, including laboratories. Safety is outside the scope of accreditation and will not be audited during an on-site laboratory accreditation assessment. If, in the opinion of the assessment team, a safety issue is observed during an assessment it will be reported to the laboratory, as required by the Act. The reporting of a safety issue will not indicate that a comprehensive safety audit has been carried out. Safety auditing is a specialist activity and the responsibility for ensuring compliance with the HSE (and HASNO) Act rests entirely with laboratory management.

### **5.3 Biosecurity**

Wool testing laboratories act as Transitional Authorities under the relevant MAFRA Standard when handling samples from overseas. Biosecurity auditing is a specialist activity carried out by MAF and the responsibility for ensuring compliance with the Act rests entirely with laboratory management.

## **6 Traceability of Measurement (cl 5.6)**

Traceability of measurement is ensured when there is an unbroken chain of comparisons of equipment of known uncertainty which link one measurement result to the next and, eventually, to a national standard of measurement (and, therefore, to the SI system). At each link in the chain, equipment is compared with reference equipment (or reference material) of the same or (usually) smaller uncertainty.

The concept of traceability also includes the competence of all the people involved, the fitness of each measurement environment, the suitability of the methods used and all other aspects of the quality management systems involved at each step in the chain of measurements.

Traceability must be established for all critical\* measurement and calibration equipment, either:

- (a) Directly to the national metrology institute (IRL - Measurement Standards Laboratory) or another such national body (e.g. NPL - UK, NMI - Australia, etc) that is part of the international mutual recognition arrangement for National Metrology Institutes
- (b) From a third party accredited calibration laboratory which is accredited by IANZ or by an accreditation body (such as NATA, UKAS, etc) with which IANZ has a mutual recognition arrangement.

The calibration certificates issued by accredited calibration laboratories must be endorsed in accordance with the requirements of the accreditation bodies concerned. This constitutes proof of traceability to national standards.

*\*Critical measurements/calibrations are those which will significantly affect the accuracy or proper performance of tests.*

IRL Industrial Research Limited  
NPL National Physical Laboratory  
NMI National Measurement Institute of Australia

## **7 Laboratory Equipment Management and Calibration (cl 5.5, 5.6)**

Laboratory equipment and its suitability is as important as the competence of the staff using it. An accredited laboratory will be expected to possess and maintain all equipment necessary to carry out the tests requested for inclusion in the scope of accreditation.

Where specialised wool testing equipment is detailed in standard test methods, the laboratory must ensure initially and when changes are made that it meets the tolerances and other requirements of the standard. Records of such commissioning must be retained.

### **7.1 Maintenance and repair**

Laboratories must have a management system ensuring regular maintenance of major equipment items and for recording the history of their maintenance and repair. Essential features of such a system are:

- (a) Unique identification of major items through a serial number or other distinguishing characteristic
- (b) Date of placement in service of major items together with details of any restrictions on their location within the buildings of the laboratory
- (c) Records of dates of maintenance by staff or outside specialists
- (d) Details of any detected defects, damage, modifications or repairs and the relevant dates and corrective actions, and
- (e) Scheduling of periodic maintenance in line with manufacturers' recommendations or the laboratory's own maintenance programme.

### **7.2 Calibration**

Records of calibrations, whether carried out externally or in-house, must meet the traceability requirements given above in 6. In-house calibration methods need to be documented in the quality system along with an assessment of the related uncertainty of measurement. These in-house methods must also cover making of standard solutions, checks on chemicals when received, checks on ovens and furnaces, as well as calibration of balances, thermometers, fibre diameter measuring equipment, length and strength measuring equipment and colorimeters.

Guidelines on recalibration intervals for specific items of equipment are detailed in Appendix 3. The guidelines set out maximum periods of use before equipment must be recalibrated. These periods have been established by accepted industry practice and, in most instances, are the maximum permitted recalibration intervals as laid down by international convention. Where a test method or operating environment requires a more stringent recalibration period than given here, the more frequent calibration will apply.

IANZ may accept reduced or extended calibration intervals based on factors such as history of stability, accuracy required and ability of staff to perform regular checks.

### **7.3 Reference materials**

Reference materials used to standardise equipment such as air flow meters, Laserscan, OFDA and colorimeters must be from a certified source. Traceability requirements are given in 6 above. Additional requirements for certified reference materials are given in ISO/IEC Guide 34 and in International Laboratory Accreditation Cooperation (ILAC) document G12.

## **8 Laboratory Staff (cl. 5.2)**

The qualifications and experience required for the technical and other senior staff of a laboratory will be carefully evaluated during the assessment. Factors which will be considered include:

- (a) The number of tests for which accreditation is sought
- (b) The technical complexity of the procedures involved
- (c) The frequency of performance of specific tests, particularly those procedures that are judged to be highly experience-dependent, and
- (d) The extent that senior staff maintains familiarity with the development of methodology and adoption of new methodology within the laboratory.

Subordinate staff must have suitable qualifications or training, and have sufficient experience and ability to perform required tasks.

Where a high seasonal workload necessitates the employment of substantial numbers of temporary testing staff, there must be a detailed system of on-the-job training, a means of demonstrating proficiency and records of the training received.

Requirements for IANZ Approved Signatories are detailed in Appendix 2. IANZ endorsed test reports and certificates must be signed by at least one Approved Signatory.

## **9 Test Methods (cl. 5.4)**

Accreditation is normally granted only for internationally or nationally accepted standard test procedures or non-standard procedures (in-house methods) that have been appropriately validated, and which are performed regularly. All test procedures and internal calibration procedures must be documented in the laboratory's technical manuals.

Only IWTO test methods and Regulations can be used if an IWTO Licensed laboratory is to issue IWTO test certificates. The Licensing Panel of IWTO has issued some restrictions on modifications of IWTO methods, which must be considered if departures or modifications to methods are being undertaken.

When equivalence to an IWTO (or any other standard test method) is to be demonstrated, the requirements of IWTO 0 must be followed.

If technical staff do not attend the IWTO conferences and TX/12 meetings regularly then the laboratory's management system must contain a procedure to keep up to date with revisions of methods.

## **10 Automated Test Equipment and Testing Systems (cl. 5.4.7)**

Appropriate quality assurance is needed of all in-house developed software. Automatic test equipment must be calibrated in a similar manner to other equipment.

The following comments apply to the use of computers for direct data capture and control of the testing operation. Where control is by proprietary software such as that supplied with some calibrators, validation will only be required of the individual calibration routines for instruments and not for the programme supplied by the manufacturer.

For in-house developed software, standard packages of raw data can be developed for feeding through the system to check routines on development or modification of the system. Care should be taken to ensure that such packages cover the expected range of values and include combinations of peculiar circumstances to highlight faults in basic logic of the programme or its subroutines.

Alternative systems using spreadsheets or other software may also be used. Reference artefacts may be held to check the operation of the whole system at appropriate intervals.

The results of this testing should be recorded and incorporated in the maintenance history. Software maintenance should include a back-up regime and a system recovery plan.

Electronic data must be treated in an equivalent way to hard copy to ensure it is not lost or changed without an audit trail.

## **11 Uncertainty of Measurement (cl. 5.4.6)**

It is important for testing laboratories to understand the concept of uncertainty of measurement. Wool testing methods have traditionally been strong on collaborative testing (trailing) of new methods and much information is available on their reproducibility by the time they are approved for use. Published methods usually contain both confidence interval data and maximum likely difference data.

While it is accepted that this information is not the same as the uncertainty as defined in the *Guide to the Expression of Uncertainty in Measurement* published by ISO, it is considered sufficient to meet the intention of ISO 17025.

While IWTO methods and Regulations adequately cover uncertainty, in-house methods may not. If accreditation is sought for such methods, appropriate variability data will need to be developed and provided to IANZ.

Because of the contractual nature of test certificates used to specify deliveries of raw wool, the requirement to report the uncertainty when test results lie within the window of uncertainty will not be enforced.

## **12 Sampling (cl. 5.7)**

The IANZ requirements for sampling and weighing of wool to be certified in an accredited laboratory are given in the IANZ supplementary criteria document, C8.1. This covers sampling:

- (a) By laboratory staff
- (b) Under full time supervision by laboratory staff
- (c) By accredited representatives.

## **13 Test Records and Certificates**

ISO/IEC 17025, clause 5.10.2, specifies the IANZ requirements for test reports and certificates, whether these are paper or electronic. IWTO also has recommended formats for IWTO certificates. Many methods also specify what must be reported.

Where a test departs in some significant manner from the specified standard method or the sampling regulations then a test house cannot issue an IWTO certificate but must issue a test report instead.

## **14 Quality Control**

Wool testing laboratories normally have sophisticated systems of monitoring the stability of test output. These can involve comparison of current reproducibility and repeatability data against historical values as well as retesting of known artefacts.

Inter-comparisons are frequently carried out to resolve apparent problems with tests, both nationally and internationally.

Control charting is often used to demonstrate stability using either long run statistics from the tests or published data from standard methods.

## **15 Proficiency Testing**

IANZ expects wool testing laboratories to take part in proficiency tests whenever possible. A number of programmes are available but are not necessarily open to all industry participants. Criteria for acceptable performance are usually published by the programme organisers. It is expected that the organisers of international programmes will eventually seek accreditation to ISO/IEC Guide 43/ILAC Guide 13.

The IWTO Licensing Panel has also published minimum requirements for proficiency testing for test houses to remain licensed.

## **16 References**

*Procedures and Conditions of Accreditation - IANZ AS 1*

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

HSE: *Health and Safety in Employment Act 1992 (amended 2002).*

## **Appendix 1**

### **Classes of Test**

### **Wool Testing**

- 8.05 Sampling
  - (a) Manual grab sampling
  - (b) Machine grab sampling
  - (c) Manual core sampling
  - (d) Machine core sampling
  - (e) Subsampling staples from grab samples
  - (f) Hand sampling
    - (i) Hand sampling scoured wool
    - (ii) Hand sampling tops
  
- 8.10 Conditioning
  - (a) Standard laboratory atmosphere
  - (b) Methods of tests for textiles
  
- 8.15 Fibre Diameter
  - (a) Mean fibre diameter by projection microscope
  - (b) Mean fibre diameter by airflow
  - (c) Mean fibre diameter and distribution by OFDA
  - (d) Mean fibre diameter and distribution by Laserscan
  - (e) Mean fibre diameter of wool sliver
  
- 8.20 Wool Yield
  - (a) Yield/wool base plus vegetable matter
  - (b) Ash content
  
- 8.25 Colour
  - (a) Colour
  - (b) Stain colour rating
  
- 8.26 Wool Fibre Length
  - (a) Length after carding including waste
  - (b) Mean fibre length and length distribution of wool sliver
  
- 8.27 Wool Length and Strength
  - (a) Mean staple length and staple strength
  
- 8.28 Wool Bulk
  - (a) Mean bulk
  
- 8.30 Scoured Wool Tests
  - (a) Condition testing
  - (b) Residual grease testing
  - (c) Vegetable matter and alkali-insoluble impurities in scoured wool
  - (d) Ash content
  - (e) Ethyl alcohol extractables
  - (f) Dichloromethane extractables
  - (g) Pesticide testing

- 8.32 Tests on Wool Tops
  - (a) Condition testing
  - (b) Mean fibre diameter of wool sliver by airflow
  - (c) Mean fibre diameter of wool sliver by OFDA
  - (d) Mean fibre diameter of wool sliver by Laserscan
  - (e) Mean fibre length and length distribution of wool sliver
  - (f) Residual grease
  
- 8.35 Wool Additional Parameters
  - (a) Percentage of medullated fibres by projection microscope
  - (b) Percentage of medullated fibres by OFDA
  - (c) pH of water extract
  
- 8.45 Wool Matching and Interlotting
  - (a) Combined certificate for yield and fineness
  - (b) Combined certificate for colour
  - (c) Objectively matched interlots
  
- 8.50 Wool Certification
  - (a) Format of IWTO certificate
  - (b) Requirements for the issue of test certificates for raw wool
  - (c) Requirements for the issue of test certificates for scoured and carbonised wool
  - (d) Requirements for the issue of staple test certificates
  - (e) Requirements for the issue of sliver test certificates
  
- 8.90 Other Wool Tests

## Appendix 2

### Approved Signatories

Supervisory staff in accredited organisations must be competent and experienced in the technical areas covered by their accreditation. They must be able to oversee the operations and cope with any problems that might arise in their work or that of their colleagues or subordinates. Such staff members, nominated by their organisations, may be granted signatory approval by the Testing Laboratory Registration Council on the recommendation of IANZ. Approved Signatories may authorise technical procedures and the release of IANZ endorsed work.

The qualifications and experience required of Approved Signatories and other technical staff members cannot be rigidly specified, but must be appropriate to the work in which they are engaged. Approved Signatories would normally hold tertiary qualifications or equivalent professional recognition in the relevant discipline.

Organisations engaged in a restricted range of repetitive work may have that work controlled by an Approved Signatory with appropriate practical experience and specific training in that work but without formal qualifications.

#### Approved Signatories

Approved Signatories are the knowledgeable staff members who, where relevant:

- (a) Develop and implement new operational procedures
- (b) Design quality control procedures, set action criteria and take corrective actions
- (c) Identify and resolve problems
- (d) Authorise the release of all IANZ endorsed reports
- (e) Take responsibility for the validity of the results.

Every accredited organisation must have at least one Approved Signatory covering each class of test. Accreditation is automatically suspended for any class of test where there is no Signatory.

All IANZ endorsed calibration certificates or reports must be authorised by an Approved Signatory holding approval in that discipline, who will take full responsibility for the validity of the work. Authorisation can be by signing, or by preprinted signature or electronic signature with appropriate software safeguards covering release of the report information.

Signatory approval is recognition of personal competence. However, it relates to the accreditation of the employing organisation and is, therefore, not automatically transferable to another organisation. It lapses when an Approved Signatory leaves the accredited organisation or changes their role significantly within the accredited organisation.

The following are considered when IANZ assesses the suitability of staff members as Approved Signatories:

- (a) Relevant qualifications and/or experience. If Approved Signatories do not have relevant tertiary qualifications they must have sufficient relevant experience enabling them to comply with the requirements listed below
- (b) Position in the staff structure. Approved Signatories must be technical personnel closely involved in the day to day operations of the accredited organisation
- (c) Familiarity with procedures and awareness of any limitations of these procedures. Approved Signatories must have appropriate personal experience in the work procedures for which they hold approval. They must be aware of any limitations of these procedures, and must understand the scientific basis of the procedures
- (d) Ability to evaluate results critically and a position in the staff structure which makes them responsible for the adequacy of results

- (e) Knowledge of the quality assurance procedures in operation and ability to take appropriate and effective corrective action, when required
- (f) Knowledge of and a commitment to the IANZ requirements for Approved Signatories and for accreditation. This will include being conversant with the principles of effective quality management embodied in ISO 17025 and relevant Specific Criteria
- (g) Sufficient experience with the accredited organisation to address the above points. It is difficult to specify an exact time a proposed Approved Signatory should have spent in the organisation as it is dependent on their previous knowledge and experience and their current role in the accredited organisation. It is unlikely that the time would be less than six months, but exceptional circumstances may apply.

Signatory approval is normally granted only to a staff member in charge, a section leader, a departmental manager or a senior staff member who authorises the release of reports/certificates and who can also satisfy the above requirements.

Staff members may be granted signatory approval for all of the work included in their organisation's scope of accreditation or for only specific work or classes of work relating to their area of personal expertise.

Signatory approval is available to a person engaged by an accredited organisation as a consultant with respect to work done within the scope of accreditation of that organisation, provided that there is a written agreement between the parties setting out the extent of the authority and responsibility of the consultant in relation to the services provided. The consultant's position in the organisation must be such that they can perform their role as a technical decision maker as effectively as if they were an employee.

Staff members of the accredited organisation who are not engaged full-time are also eligible for signatory approval, provided that the circumstances in which they are called upon to exercise their signatory function and their access to, and knowledge of, the technical operations are such that they are able to take full responsibility for the results they authorise.

The position and function of an Approved Signatory are quite distinct from that of an Authorised Representative. An organisation will normally have only one Authorised Representative who is appointed by the organisation. They will be the only contact point for IANZ and need not have any particular professional or technical expertise. The organisation may, however, have several Signatories approved by IANZ and with their own individual areas of expertise.

An Authorised Representative who is not also an Approved Signatory may not authorise the release of IANZ endorsed reports.



Type of Equipment	Period between successive calibrations	Calibration procedures and equipment requirements
<b>Balances and Scales (continued)</b>	(iii) *Six monthly	Repeatability checks. The standard deviation of the results can be compared against the results recorded in the last external calibration certificate.
<b>Callipers – Vernier/Dial</b>	*Five years	See IANZ technical guide AS TG 1.
<b>Colorimeters</b>	*Full calibration when performance of intermediate checks, performance in internal monitoring or performance in proficiency tests indicates stability or reproducibility is no longer acceptable.	Intermediate checks must be done every eight hours against a working calibration tile as specified in IWTO 56.
<b>Furnaces</b>	*Monthly or more often.	Check temperature controller/indicator against reference thermometer
<b>Gauge Blocks/ Length Bars</b>	Five years	By an IANZ accredited calibration laboratory
<b>Hygrometers</b>	*Annual calibration of the thermometers in Whirling and Assman hygrometers. The psychrometric coefficient of the Assman should be determined at least every five years	*Inspection of the wicks on the hygrometers must be carried out regularly to ensure they are clean.
Mechanical (e.g. hair type) thermohygrometers	*Three months	By comparison with Assman or electronic hygrometer
Electrical impedance sensor	One year	
<b>Laserscan and OFDA</b>	As for Air Flow Meters above	
<b>Micrometers (hand)</b>	*Five years (complete)	See IANZ technical guide AS TG 1.
<b>Masses</b>	Five years	
(a) Reference masses of integral construction stainless steel or nickel-chromium alloy.	Five years	
(b) Masses of screw knob or sealed plug construction made of stainless steel, nichrome, plated brass or other non-corrodible highly finished material.	Three years	
<b>NIR Equipment</b>	*At manufacturer's recommended intervals or when quality control checks show stability is outside established criteria.	Calibration in accordance with IWTO 10 or IWTO 19.
<b>Ovens</b>		
Conditioning and Drying	*Daily or when used	Check temperature against calibrated thermometer.

Type of Equipment	Period between successive calibrations	Calibration procedures and equipment requirements
<b>Rules</b>	*Five years	See IANZ technical guide AS TG 1.
<b>Stop Watches and Clocks</b>		
(a) Electric	*Twelve months	Comparison against radio time "pips", Telecom talking clock or Teletext timer.
(b) Mechanical	*Three months	
<b>Tachometers</b>	Twelve months	By accredited laboratory or NMI
<b>Thermometers</b>		
(a) Reference liquid-in-glass	Five years (full calibration) Check ice point immediately after initial calibration then at least every six months.	
(b) Working liquid-in-glass	*Five years (full calibration). Check ice point immediately after initial calibration then at least every six months.	See IANZ technical guide AS TG 3
or alternatively	*Inter-compare with reference thermometer(s) at points in the working range every six months	See IANZ technical guide AS TG 3
(c) Electronic (sensors that are thermocouples, thermistors or other integrated circuit devices)*	One year (full calibration)	
(d) Resistance	Five years (full calibration) or when the ice point drift is more than five times the uncertainty of calibration.  Check at ice point before use or at least every six months.  <i>Working hand-held resistance thermometers can be checked using the alternative procedure for glass thermometers.</i>	
<b>Tiles-Reference Ceramic</b>	Five years	By accredited laboratory or NMI (e.g. Ceram Research-UK)
<b>Volumetric Glassware</b>		
(a) Flasks, pipettes, burettes and measuring cylinders used for reference purposes.	*On commissioning	AS 2163 to 2167. Cross check by weighing with distilled water
<b>Length and Strength Equipment</b>		
(a) ATLAS and Staple Breaker	*Daily checks using length bars and mass. Check balances.	*In accordance with manufacturer's recommendations
(b) Length after carding	*On commissioning, then check every six months and calibrate every twelve months.	See NZS 8719 and AS/NZS 4844.1

## **Appendix 4**

### **Branch Laboratories**

New Zealand wool testing laboratories continue to operate a number of branches. These act only as sampling supervisors and suppliers for the main test houses, although a minority also continue to carry out conditioning of scoured wool. Data entry of sampling information and of check test results, as well as liaison with scours, brokers and private merchants is also carried on by branch staff.

Length and strength sub-sampling and tufting and auditing of accredited representatives and other sample suppliers is also carried out by branch staff.

Branch staff are generally responsible for sample integrity and security.

Branch laboratories are assessed every two years on a rotating basis by IANZ.