Specific Criteria for Accreditation
Wool Testing

Fifth Edition July 2020

The NZ mark of competence
Tohu Matatau Aotearoa

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Wool Testing

AS LAB C8

Fifth Edition July 2020

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Contents

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 ISO/IEC 17025 *General requirements for the competence of testing and calibration laboratories*, and the IANZ publication *Procedures and Conditions for Accreditation* (AS 1), 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/IEC 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.

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/IEC 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/IEC 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 assessment programme for wool testing laboratories comprises a routine reassessment every four years, with a technical assessment at year two, and surveillance assessments in between. Branch laboratories, when testing is being performed, are assessed at least once every four years.

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) Slipe 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 slipe 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

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 ºC ± 2 ºC, 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 at Work Act (HSAW 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 HSAW (and HASNO) Act rests entirely with laboratory management.

5.3 Biosecurity

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

6 Traceability of Measurement

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 (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.

NPL National Physical Laboratory (NMI of the UK)

NMI National Measurement Institute of Australia

7 Equipment Management and Calibration

An accredited laboratory must have at least one staff member who is competent in the testing being 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 (CRM's) are given in ISO 17034.

8 Laboratory Staff

An accredited laboratory must have at least one staff member who is competent in the testing being undertaken.

The qualification and appointment of Key Technical Personnel is an internal process in the laboratory under the responsibility of the laboratory management.

The expected roles and qualifications of a Key Technical Person are given in Appendix 2.

The following requirements in regard to Key Technical Personnel are reviewed as part of the assessment process:

(a) Appointment of Key Technical Personnel will be the responsibility of a designated senior laboratory officer who is a member of the laboratory's senior management team. Laboratories are required to have a documented person/position specification for Key Technical Persons and a documented and formal process for their qualification and appointment

(b) The laboratory will maintain a list of current Key Technical Personnel, including the technical scope of their areas of responsibility. This list may be included in the laboratory's quality manual or as a separate document but must be maintained up-to-date at all times. The technical scope for each individual will be described in a manner to suit the laboratory's circumstance and organisational structure but there must be at least one Key Technical Person appointed for each test or group of tests in the laboratory's scope of accreditation. The laboratory may choose to use the Classes of Test detailed in Appendix 1 with additional qualifiers as appropriate, but this is not mandatory

(c) The list of Key Technical Personnel and their individual scope of responsibility must be notified to IANZ who will maintain this listing for each accreditation. IANZ will request this information in the Application for Accreditation or Reassessment documentation provided prior to the three yearly full reassessment. The list will also be reviewed with laboratories during their annual surveillance assessment

(d) Changes to Key Technical Personnel listings (including individuals who have left the laboratory, new Key Technical Person appointments, or changes in the technical scope of responsibility) made between annual on-site assessments must also be notified to IANZ. This is the responsibility of the laboratory's Authorised Representative

(e) In addition to the laboratory's usual training records, each Key Technical Person is required to have a brief CV-type summary of qualifications and experience. This CV information will be requested by IANZ for each appointed Key Technical Person in the Application for Accreditation/Reassessment documentation described above. This information is also expected to be provided to IANZ when new Key Technical Personnel are appointed and notified to IANZ outside of annual assessments

(f) Where a laboratory loses the sole Key Technical Person for all or part of their scope of accreditation and no new appointment is made by the laboratory management, then the laboratory's accreditation (or part thereof) will be suspended until such time as a new appointment is notified to IANZ. Where new Key Technical Personnel appointments are made outside of routine reassessments, and particularly when a new appointment is the sole Key Technical Person for all or part of the accreditation, IANZ reserves the right to conduct an on-site assessment of the laboratory to be assured the laboratory's systems and integrity of the laboratory's tests results will continue to be maintained

(g) All IANZ-endorsed test reports issued by an accredited laboratory must be signed or authorised by at least one Key Technical Person nominated by the laboratory. See section 13.

The appointment of Key Technical Personnel effectively means the responsibility for qualification of key individuals within a laboratory lies with the laboratory management. IANZ Assessment Teams will no longer feel obliged to interview all appointed Key Technical Personnel. The Key Technical Personnel will still, generally, be expected to be the escorts for IANZ assessment teams during the course of an on-site assessment, with any of the appointed individuals being selected for the particular part of the scope of accreditation being assessed. The team may also choose to interview other levels of technical staff. In the case where a particular Key Technical Person is not able to demonstrate to the assessment team that the laboratory is continuing to maintain the requirements for accreditation, it is not the individual who is considered to have "passed" or "failed" but rather the laboratory as a whole on the grounds of inadequate, continuous technical supervision and it may be that the affected part of the scope of accreditation is suspended.

Non – Key Technical Personnel 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.

9 Test Methods

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 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

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

It is important for testing laboratories to understand the concept of uncertainty of measurement.

Wool testing methods have traditionally been strong on collaborative testing (trialling) 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/IEC 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 at this time.

12 Sampling

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;

by accredited representatives.

13 Test Records and Certificates

ISO/IEC 17025 specifies the 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

The IANZ policy on participation in proficiency activities is set out in the IANZ Technical Policy No. 2 *Participation in Proficiency Testing Activities*. All IANZ accredited Wool testing laboratories are required to maintain conformity with this policy and 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 17043.

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

16 References

1. *Procedures and Conditions for Accreditation* (AS1), IANZ
2. ISO/IEC 17025 *General requirements for the competence of testing and calibration laboratories*.
3. HSAW: Health and Safety at Work Act
4. IANZ Technical Guide 1: *Simple Linear Measurements* (AS TG1)
5. IANZ Technical Guide 3: *Working Thermometers Calibration Procedures* (AS TG3)
6. AS 2163: *Laboratory glassware – Measuring Cylinders*
7. AS 2164: *Laboratory glassware – One-mark volumetric flasks*
8. AS 2165: *Laboratory glassware - Burettes*
9. AS 2166: *Laboratory glassware – One-mark pipettes*
10. AS 2167: *Graduated straight pipettes*
11. NZS 8719: *Method for the measurement of the fibre length after carding of scoured wool*
12. AS/NZS 4844.1: *Wool - Measurement of fibre properties - Measurement of the fibre length after carding of scoured or carbonised wool*
13. IWTO 10: *Method for the Determination of Dichloromethane Soluble Matter in Combed Wool and Commercially Scoured or Carbonised Wool*
14. IWTO 19: *Determination of Wool Base and Vegetable Matter Base of Core Samples of Raw Wool*
15. ISO 10012 *Measurement management systems – Requirements for measurement processes and measuring equipment*
16. ISO/IEC 17043 *General requirements for proficiency testing*
17. ISO 17034 *General requirements for the competence of reference material producers*

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: Key Technical Personnel

Supervisory staff in accredited laboratories 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 colleague or subordinates. Such staff members, formally appointed by the senior management of the laboratory, are referred to as Key Technical Personnel.

The following sets out IANZ's expectations in relation to who the laboratory management should be appointing as Key Technical Persons.

(a) Key Technical Persons would be expected to have:

  (i) A tertiary qualification or equivalent professional recognition in the relevant discipline. Laboratories engaged in a restricted range of repetitive work may be able to appoint Key Technical Personnel with appropriate practical experience and specific training in that work but without formal qualifications

  (ii) A position in the staff structure which provides for the authority to implement necessary changes in the laboratory operation to ensure the integrity of test results is maintained. The position in the staff structure should ensure the individual can maintain a working knowledge of the quality assurance and technical systems in operation in the laboratory on a day to day basis

  (iii) A working knowledge of and commitment to the requirements for IANZ accreditation, including the quality and technical management principles embodied in ISO/IEC 17025 and relevant Specific Criteria

  (iv) The necessary scientific expertise and experience to be aware of and understand any limitations of the test procedures and to fully understand the scientific basis of the procedures

  (v) Sufficient experience in the accredited laboratory to address all of the above points.

(b) Key Technical Personnel are those individuals who are given both the responsibility and authority to:

  (i) Develop and implement new operational procedures

  (ii) Design quality control programmes, set action criteria and take corrective action when these criteria are exceeded

  (iii) Identify and resolve problems

  (iv) Take responsibility for the validity of the outputs.

(c) Key Technical Personnel would normally be those individuals who authorise the release of all test results. However, in large laboratories such authorisations may be delegated to other supervisory staff on a day to day basis provided the delegations and the basis for them are clearly documented. Such delegation of authority does not absolve the Key Technical Person from taking full responsibility for the validity of the work. The authority to release results should not be confused with the authority to issue formal test reports. See Section 8.

(d) Laboratory management may choose to appoint an individual engaged by the accredited laboratory as a consultant where their Key Technical Person responsibilities relate to work done within the scope of accreditation. There is an expectation that there would be 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 laboratory organisation should be such that they can perform their role as a technical decision maker as effectively as if they were an employee.

(e) Staff members of an accredited laboratory who are not engaged full-time could also be appointed as Key Technical Persons. However, the circumstances in which they are called upon to exercise their Key Technical Person responsibilities and their access to and knowledge of the technical operations should be such that they are able to take full responsibility for the work they authorise or oversee.

Appendix 3: Recommended Calibration Intervals

The following table sets out the normal periods between successive calibrations for a number of reference standards and measuring instruments. It must be stressed that each period is generally considered to be the maximum appropriate in each case providing that the other criteria as specified below are met:

(a) The equipment is of good quality and of proven stability, and

(b) The laboratory has both the equipment capability and staff expertise to perform adequate internal checks, and

(c) If any suspicion or indication of overloading or mishandling arises, the equipment is checked immediately and thereafter at frequent intervals until it can be shown that stability has not been impaired.

Where the above criteria cannot be met, appropriately shorter intervals may be necessary.

It is possible to consider submissions for extension of calibration intervals based on factors such as history of stability, frequency of use, accuracy required and ability of staff to perform regular checks. It is the responsibility of the testing laboratory to provide evidence that its calibration system ensures that confidence in the equipment is maintained. Application of the requirements of ISO 10012: *Measurement management systems – Requirements for measurement processes and measuring equipment* needs to be considered when seeking an extension of intervals.

Where calibrations and checks have been performed, adequate records of these measurements must be maintained. IWTO standard methods do not normally specify re-calibration frequencies. In some methods (IWTO 56 for example) intermediate checks are specified either for standardisation purposes or for stability monitoring. Accredited laboratories are expected to have systems of checks, internal stability monitoring or proficiency testing in place, and to re-calibrate when such data indicates that stability of the relevant measurement parameter is no longer under control.

*NB: Checks or calibrations indicated * can be done internally by a laboratory providing they possess the necessary reference equipment, documented procedure and technical competence. These must be recorded.*

Type of equipment	Maximum period between successive calibrations	Procedures
Air Flow Meters	*At least annually and when new Interwoollabs tops are supplied. Criteria must be established for putting in new calibration data when measurements are no longer under control	Routine cleaning/maintenance, top checks, and orifice plate checks must also be carried out more often. Modification of chambers will require dimensional checks and recalibration.
Balances and Scales	Initial calibration and three yearly recalibrations Accompanied by (a) *Each weighing (b) *One Month	By an accredited calibration laboratory or *Calibration using traceable certified masses. IANZ Technical Guide AS TG 2: *Laboratory Balances – Calibration Requirements*. Staff performing calibrations need to be formally trained. Annual servicing is recommended. Zero check. One point check using a known mass close to balance capacity.

Type of equipment	Maximum period between successive calibrations	Procedures
	(c) *Six months	Repeatability checks at the upper and lower ends of the scale. The standard deviation of the results can be compared against the results recorded on the last external calibration certificate.
Callipers (Vernier/Dial)	*Five years	See IANZ Technical Guide AS TG 1.
Colorimeters	*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.
Furnaces	*Monthly or more often.	Check temperature controller/indicator against reference thermometer
Gauge Blocks/ Length Bars	Five years	By an IANZ accredited calibration laboratory
Hygrometers Mechanical (e.g. hair type) thermohygrometers Electrical impedance sensor	*Annual calibration of the thermometers in Whirling and Assman hygrometers. The psychrometric coefficient of the Assman should be determined at least every five years. *Three months One year	*Inspection of the wicks on the hygrometers must be carried out regularly to ensure they are clean. By comparison with Assman or electronic hygrometer
Laserscan and OFDA	As for Air Flow Meters above	
Micrometers (hand)	*Five years (complete)	See IANZ Technical Guide AS TG 1.
Masses Reference masses of integral construction stainless steel or nickel-chromium alloy. Masses of screw knob or sealed plug construction made of stainless steel, nichrome, plated brass or other non-corrodible highly finished material.	 Five years Three years	
NIR Equipment	*At manufacturer's recommended intervals or when quality control checks	Calibration in accordance with IWTO 10 or IWTO 19.

Type of equipment	Maximum period between successive calibrations	Procedures
	show stability is outside established criteria.	
Ovens - Conditioning and Drying	*Daily or when used	Check temperature against calibrated thermometer.
Rules	*Five years	See IANZ Technical Guide AS TG 1.
Stop Watches and Clocks (a) Electric (b) Mechanical	 *Twelve months *Three months	 Comparison against radio time "pips" or similar e.g. IRL Talking Clock (0900) 45678.
Thermocouples Reference Working	 Three years or 100 hours use (whichever is sooner) *Six months	 By an accredited calibration laboratory. Single point within the working range against a reference thermometer or thermocouple.
Thermometers (Liquid in glass) Reference Working	 Five years (complete) *Six months *Initial *Six months	 By an accredited calibration laboratory, followed by an ice point check on receipt. Ice point (see IANZ Technical Guide AS TG 3). Check against reference thermometer / thermocouple across working range or at points of use. (See IANZ Technical Guide AS TG 3). Check at ice point or at points of use.
Thermometers (Resistance) Reference Working	 Five years *Six months *Initial *Six months	 By an accredited calibration laboratory, followed by an ice point check on receipt. Ice point. If outside five times the uncertainty of the calibration, complete recalibration is required. Check against reference thermometer / thermocouple across working range or at points of use. (See IANZ Technical Guide AS TG 3). Ice point. If outside five times the uncertainty of the calibration,

Type of equipment	Maximum period between successive calibrations	Procedures
		complete recalibration is required.
Thermometers (Handheld non-resistance electronic) Working *Note: Handheld non-resistance working thermometers are generally considered of insufficient quality to be used as reference thermometers*	*One year	Check against reference thermometer/thermocouple across working range or at points of use (see IANZ Technical Guide AS TG 3).
Tiles - Reference Ceramic	Five years	By accredited laboratory or NMI (e.g. Ceram Research-UK)
Volumetric Glassware (Flasks, pipettes, burettes and measuring cylinders used for reference purposes)	*On commissioning	AS 2163 to 2167. Cross check by weighing with distilled water
Length and Strength Equipment ATLAS and Staple Breaker Length after carding	*Daily checks using length bars and mass. Check balances. *On commissioning, then check every six months and calibrate every twelve months.	*In accordance with manufacturer's recommendations See NZS 8719 and AS/NZS 4844.1

Appendix 4: Branch Laboratories

New Zealand wool testing laboratories continue to operate a number of branches. While historically many of these branches carried out testing, generally they now act only as sampling supervisors and suppliers for the main test houses, and many are not physical branches anymore but consist of an organisation representative responsible for a designated geographical area.

Data entry of sampling information and of check test results, as well as liaison with scours, brokers and private merchants can be carried 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.

A minority of branches also continue to carry out testing e.g. conditioning of scoured wool. Where actual testing takes place, branch laboratories are assessed at least once every four years by IANZ.

Where the branch is only responsible for sampling then they will not be indicated separately on the scope of accreditation but the on-going competency of the sampling will be confirmed during assessments of the main laboratory, with the organisation needing to demonstrate compliance to the relevant sections of IANZ supplementary criteria document, AS LAB C8.1.

If compliance to IANZ supplementary criteria document, AS LAB C8.1 cannot be demonstrated by assessment of the main laboratory then IANZ reserves the right to perform assessments of branches as required to demonstrate this compliance.