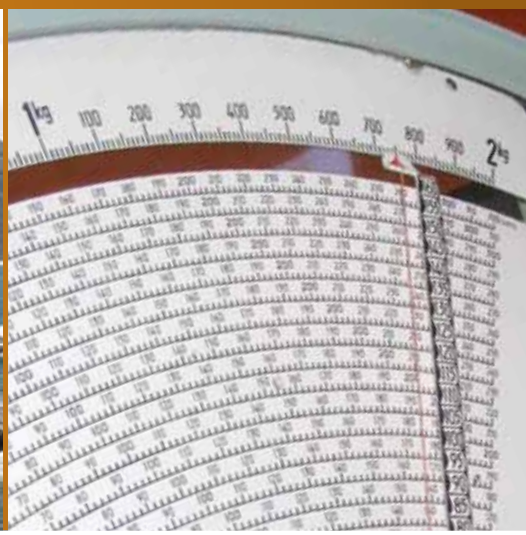
Australian Government

Department of Innovation
Industry, Science and Research

AUSTRALIA'S STANDARDS AND CONFORMANCE INFRASTRUCTURE



AN ESSENTIAL FOUNDATION

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Further information

For more information, please contact:

Manager
Standards and Conformance Policy Section
Department of Innovation, Industry, Science and Research
GPO Box 9839
Canberra ACT 2601

Telephone: +61 2 6213 6000
Facsimile: +61 2 6213 7000
Email: TBT@innovation.gov.au

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Foreword

Standards and conformance are the backbone of everyday life. They give confidence to consumers, certainty to business, and clarity to the scientific community. Every time we read a label, we affirm our trust in the unsung Australian institutions in this publication. We are right to do so.

Australia has developed a world class standards and conformance infrastructure over many decades, aligned with our trading partners and responsive to our needs.

Four key bodies work together with the Government to meet consumer needs, support domestic and export-orientated industries and provide a firm foundation for investment:

- The National Measurement Institute, responsible for metrology - the science of measurement;
- Standards Australia, responsible for the development of consensus based documentary standards;
- The National Association of Testing Authorities, responsible for the accreditation of testing laboratories; and
- The Joint Accreditation System of Australia and New Zealand, responsible for the accreditation of certification bodies.

This publication explains both their individual contributions to Australia's Standards and Conformance Infrastructure, and their combined place at the heart of our economy and our way of life.

The Gillard Labor Government is proud to support these organisations in their efforts to provide an effective, cost efficient and contemporary standards and conformance infrastructure for Australia.

They bring order to a volatile world.

Senator Kim Carr
Minister for Innovation, Industry, Science and Research

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A world without standards and conformance?

A world without standards and conformance would soon descend into chaos. Transport and trade would become impossible. The Internet would not function. Hundreds of thousands of systems dependent on information and communication technologies would falter or fail — from government to banking, healthcare to air traffic control and emergency services to disaster relief.

Without standards and conformance, ordinary everyday tasks would be difficult or even dangerous to carry out. Equipment safety standards provide protection at work and at play. At home, standards ensure electrical appliances connected to the grid are safe to operate. Other standards provide confidence that the energy ratings on refrigerators and air-conditioners are meaningful. Audio systems, television sets and DVD players, mobile telecommunications and WiFi all comply with standards to make them compatible with other systems. Mobile videos and music, online education, telemedicine, e-banking and satellite navigation systems for cars and aircraft all require a standards and conformance infrastructure to ensure they work as expected.

Standards describe the minimum set of characteristics a product or service must demonstrate to show the product or service can do what it is supposed to do. Without agreed standards, products may not be safe, lack interoperability, be inefficient or simply not work at all. Services similarly may not be delivered consistently and reliably.

Conformance and conformity assessment are mechanisms to determine if products and services do indeed conform to the relevant established standards.

Hence, an internationally aligned standards and conformance infrastructure is an essential foundation for an effectively functioning economy in today's global marketplace.

Based on the International Organization for Standardization (ISO)
World Standards Day Message
14 October 2007

Standards and Conformance Infrastructure

Box 1

Metrology (Measurement Science)

Metrology standards and the traceability of measurement to those standards provide the basis for successful trade and commerce. They help drive the continuous development of science, technology and industrial production. They are the foundation for all testing and measurements, including those associated with disease diagnosis and health care, food safety, forensic science, environmental monitoring, occupational health and safety, optimisation of production and consumer confidence and protection.

The **National Measurement Institute** (a division of the Department of Innovation, Industry, Science and Research) is responsible for measurement standards in Australia.

Standards

Standards, that is, written or documentary standards, include specifications and procedural requirements. Adherence to standards can be either to voluntary documents or to mandatory regulations and laws. Documentary standards are written by international organisations, national standards bodies, regulatory authorities, and trade and industry associations. There is also active participation of stakeholders including technical experts from industry, government, consumer groups and other affected parties in writing standards.

Standards Australia is recognised by the Australian Government as Australia's peak, non-government standards development body.

Accreditation and Conformity Assessment

Accreditation is a procedure by which an independent authoritative body (accreditation body) gives formal recognition that a conformity assessment organisation is competent to carry out specific tasks. Accreditation involves the onsite assessment of conformity assessment bodies for competence to carry out specified calibrations, tests, inspections and/or certifications of products, systems or personnel, to determine if they meet a (minimum) required standard.

Conformity assessment activities are critical to the fitness for purpose and reliability of the many products and services upon which all economies rely for, among other things, the health and safety of their citizens, and for trade. Thus, it is vitally important that they are undertaken competently and efficiently.

The **National Association of Testing Authorities (NATA)** and the **Joint Accreditation System of Australia and New Zealand (JAS-ANZ)** are Australia's accreditation bodies for testing laboratories, inspection bodies and certification bodies.

Every country needs a sound standards and conformance infrastructure to achieve its societal and economic goals. Increasingly all nations need to fully engage in the global economy and leverage the benefits of international trade to enable continued income growth and the economic wellbeing of their people.

This is where metrology, standardisation and accreditation of conformity assessment activities come into play, forming essential components of an infrastructure that supports sustainable development and a nation's ability to fully participate in the global economy (see Box 1).

The practices of measurement, standardisation and conformity assessment impact on the simplest of activities such as the time your alarm clock rings and the way the seatbelts operate in your car.

The same infrastructure also underpins the complex technologies and industrial processes that drive economic growth. Everyday commercial transactions and international trade could not take place without the support of the standards and conformance infrastructure.

It provides the essential framework for industry and government to maintain domestic and foreign confidence in our goods and services. It is also crucial to enhancing our global competitiveness, attracting investment and encouraging and supporting innovation.

Each component of Australia's standards and conformance infrastructure has a key role to play in ensuring that a high level of quality and accuracy is delivered and is consistently accepted with confidence by the community, Australian businesses and its international trading partners.

The four standards and conformance organisations in Australia (see Box 1) have formally established a new body, the Technical Infrastructure Alliance (TIA), aimed at identifying and executing joint projects to enhance this aspect of the national infrastructure. The TIA will achieve better collaboration, efficiency and innovation between the four member organisations through greater sharing of resources, expertise, knowledge and ideas. It will also act as a single point of contact for external stakeholders. The resulting enhancement of the national infrastructure will contribute to greater economic prosperity for Australia and to the better health, safety and wellbeing of all Australians.

International roles and obligations

The development and international harmonisation of standards and the mutual recognition of conformity assessment activities play a vital role in the economic growth and development of a small, open economy like Australia's.

The global nature of trade and manufacturing makes it imperative that measurement standards are comparable across the world. Trading nations recognised this need as long ago as 1875 when the Convention of the Metre or Metre Treaty was established to provide guidance and focus for developing an internationally consistent measurement system. Under the Metre Treaty many national laboratories compare their standards to ensure there is a consistent global basis for measurement. Australia plays an active role in the key international metrological organisations (see Box 2).

With the ongoing removal of tariff barriers, emphasis by governments and by the World Trade Organization (WTO) on trade liberalisation has moved to consideration of non-tariff barriers. Among the most significant of these are national and international standards together with testing and certification requirements that are not harmonised internationally.

As a member of the WTO, Australia is committed to ensuring that mandatory standards and conformity assessment procedures are not more trade restrictive than necessary. These commitments are outlined in the Technical Barriers to Trade (TBT) Agreement.

The TBT Agreement states that signatories shall not implement mandatory standards (or technical regulations in TBT terminology) that are more trade restrictive than necessary to meet legitimate objectives which include:

- national security;
- human health or safety;
- animal or plant health or safety;
- protection of the environment; and
- the prevention of deceptive practices.

It also requires signatories not to apply discriminatory conformity assessment practices to products imported from other WTO member countries.

Box 2

Key International Metrological Organisations

The **International Committee for Weights and Measures (CIPM)** consists of 18 individuals each from a different member state under the Metre Convention. The CIPM's principal task is to promote worldwide uniformity in units of measurement.

The **International Bureau of Weights and Measures (BIPM)** is mandated to provide the basis for a single, coherent system of measurements throughout the world, traceable to the International System of Units (SI). BIPM operates under the exclusive supervision of the CIPM.

The **International Organization of Legal Metrology (OIML)** is an inter-governmental organisation created in 1955. The aim of the OIML is to coordinate and harmonise the administrative and technical regulations applying to measurements and measuring instruments passed by the different countries. The purpose is to facilitate trade between countries, not only for measuring instruments, but also for all operations involving measurements.

Sources: www.bipm.org/en/committees/cipm; www.bipm.org; www.oiml.org

Box 3

International Standards Development Bodies

The **International Organization for Standardization (ISO)** and the **International Electrotechnical Commission (IEC)** are generally acknowledged as the most important international standardisation bodies in terms of size and influence. Taken together, ISO and IEC produce around 85 per cent of all international standards.

The ISO, established in 1947, is a network of national standards institutes from 163 countries and is the world's largest developer of internationally harmonised standards. It is a private non-governmental body whose members do not directly represent the governments of their countries of origin. The standards which it develops are voluntary in nature and tend to cover a broad range of subjects and markets (exceptions are standards in electrical and electronic engineering, the IEC's domain). ISO has a stock of over 18 500 international standards.

The IEC was established in 1906 and produces international standards for all electrical, electronic and related technologies. IEC provides a platform to companies, industries and governments for meeting, discussing and developing the International Standards they require. The organisation oversees the operation of 175 technical committees and subcommittees involved in setting standards. The IEC has a stock of over 6300 published standards and standards-type documents.

Sources: www.iso.org; www.iec.ch

The TBT agreement encourages members to participate in international standard setting organisations and adopt the resulting standards, for the harmonisation of voluntary and regulatory standards worldwide (see Box 3). The adoption of international standards benefits exporters by enabling the design and manufacture of products to one standard rather than a range of national standards. It also benefits consumers by increasing availability and reducing the cost of imported products consistent with an accepted international standard.

The TBT agreement also encourages members to participate in the development of standards and guides for conformity assessment procedures and to recognise the results of overseas conformity assessment bodies (see Box 4). By obviating the need for re-calibration, re-testing, re-inspection or re-certification in the importing country, such arrangements can reduce transaction costs, break down technical barriers and facilitate international trade.

Regional Engagement

Australia plays a significant regional role, including participation in several bodies within the Asia-Pacific region, the most important being the Asia-Pacific Economic Cooperation Sub-Committee on Standards and Conformance (APEC SCSC). The APEC SCSC performs several key activities including fostering an effective interface between regional and international fora, establishing and maintaining close collaboration with the five Specialist Regional Bodies (SRBs) and, through them, with the relevant international peak organisations. Australian standards and conformance bodies played an active role in the establishment and development of the SRBs (see Box 5) which are crucial links in the global standards and conformance infrastructure.

Box 5

Specialist Regional Bodies of the Asia-Pacific region

The **Asia-Pacific Metrology Programme (APMP)** is a collaboration of the region's peak measurement institutes, primarily aimed at improving regional measurement capabilities and developing international recognition of these capabilities. This provides the basis for effective participation by APMP members in the Mutual Recognition Arrangement (MRA) of the International Committee for Weights and Measures (CIPM) and dissemination of these capabilities to the Asia-Pacific user community.

The **Asia-Pacific Legal Metrology Forum (APLMF)** is a grouping of legal metrology authorities in the Asia-Pacific Economic Cooperation (APEC) economies and other economies on the Pacific Rim, whose objective is the development of legal metrology and the promotion of free and open trade in the region through the harmonisation and removal of technical or administrative barriers to trade in the field of legal metrology. APLMF members collaborate to promote the coordination and integrity of legal metrology activities and services in order to achieve greater harmony of measurement and testing within the Asia-Pacific Region and build mutual confidence in legal metrology activities and services among members.

The **Asia Pacific Laboratory Accreditation Cooperation (APLAC)** is a cooperation of accreditation bodies in the Asia-Pacific region that accredit testing and calibration laboratories, inspection bodies, proficiency testing scheme providers and reference material producers. APLAC's primary aim is to establish, develop and expand a MRA in the region to facilitate trade. APLAC is an ILAC-recognised region.

The **Pacific Accreditation Cooperation (PAC)** is an association of accreditation bodies and other interested parties that share the purpose of facilitating trade and commerce within the Asia-Pacific region. Its ultimate objective is the creation of a global system that grants international recognition of certification or registration of management systems, products, services, personnel and other programs of conformity assessment. To achieve this, PAC promotes the international acceptance of accreditations granted by its accreditation body members, based on the equivalence of their accreditation programmes. PAC operates within the framework of the IAF.

The **Pacific Area Standards Congress (PASC)** is an independent organisation of Pacific area national standards organisations. An important objective of PASC is to exchange information and views between national standards bodies and among organisations interested in standardisation and conformance. It initiates necessary actions to help ensure proper coordination of international standardisation activities to meet world needs and foster international trade and commerce.

Sources: www.apmpweb.org; www.aplac.org; www.aplmf.org; www.apec-pac.org; www.pascnet.org

Box 4

Key International Accreditation Bodies

The **International Laboratory Accreditation Cooperation (ILAC)** is the principal international forum for laboratory accreditation bodies. The primary aim of ILAC is to facilitate trade by promoting the acceptance of test and calibration results from accredited facilities across national borders. ILAC, as well as regional laboratory accreditation cooperations such as the Asia Pacific Laboratory Accrediation Cooperation (APLAC), have been instrumental in the development of mutual recognition agreements/arrangements (MRAs) between national accreditation bodies. Under these MRAs, each organisation recognises the equivalence of accreditations granted by its overseas counterparts and promotes this equivalence to government and industry.

The **International Accreditation Forum (IAF)** is the international association of accreditation bodies and other bodies interested in conformity assessment in the area of the certification of management systems, products, services, personnel and similar programs. Its primary function is to develop a single worldwide program of conformity assessment that reduces the risk for business and its customers by assuring them that certificates issued by conformity assessment bodies accredited by IAF Multilateral Recognition Arrangement (MLA) signatories are equally reliable. The Pacific Accreditation Cooperation (PAC) undertakes similar work at the regional level.

Sources: www.ilac.org/home.html; www.aplac.org/aplac_mra.html; www.iaf.nu/

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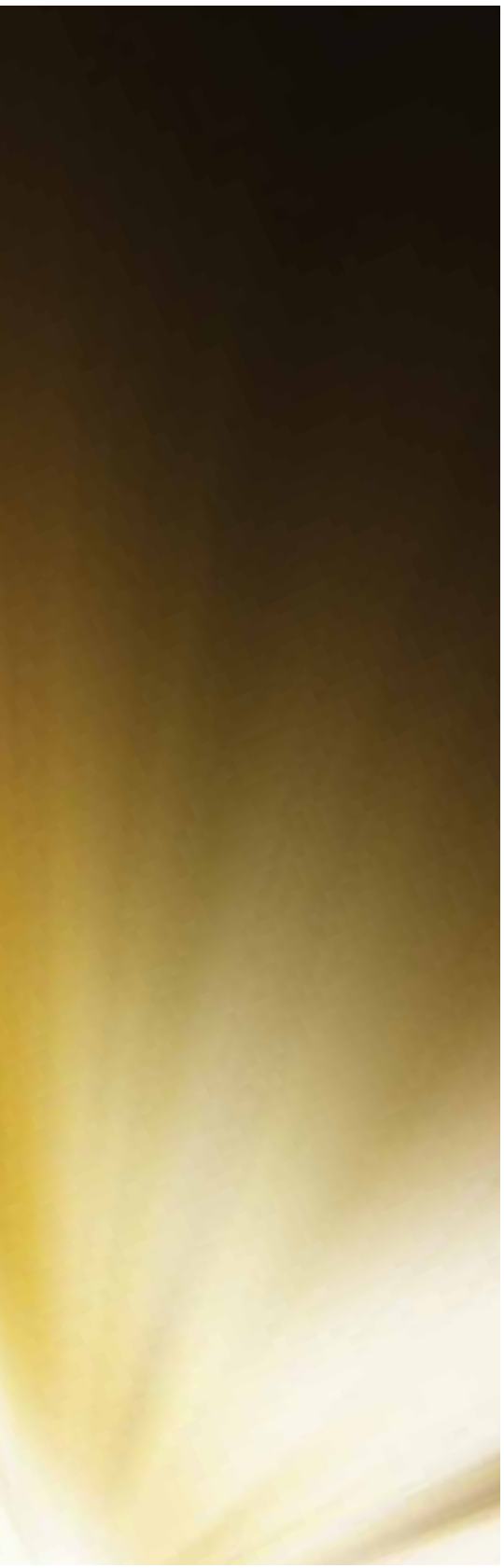


Department of Innovation, Industry, Science and Research

Australia's standards and conformance infrastructure

Consistent with Australia's obligations under the World Trade Organization Technical Barriers to Trade (WTO TBT) Agreement, the Australian Government sets policies that promote the alignment with international standards and mechanisms to facilitate the recognition of measurement standards and conformity assessment results.

Australia's standards and conformance infrastructure works within international and regional frameworks to ensure we are on the cutting edge of standards and conformance policy. The infrastructure makes trade between nations and within Australia safer and fairer and reduces the technical and often costly barriers to trade. Our infrastructure includes governmental, metrological, standards and conformance bodies that collaborate to provide a cohesive and effective approach to standards and conformance policy.

The Commonwealth Department of Innovation, Industry, Science and Research (Department of Innovation) is the Australian Government's lead organisation for standards and conformance policy issues. Key Australian standards and conformance organisations that operate within this policy context are:

- The National Measurement Institute – NMI (a division of the Department of Innovation, Industry, Science and Research);
- Standards Australia (a membership based, not for profit standards development organisation);
- The National Association of Testing Authorities – NATA (a membership based, not for profit organisation); and
- The Joint Accreditation System of Australia and New Zealand – JAS-ANZ (a bi-national government owned accreditation body).

Role in the technical infrastructure

The Department of Innovation is committed to developing policies and delivering programs in partnership with stakeholders that provide lasting economic benefits to ensure our competitive future.

The department seeks to facilitate international trade, improving market access for Australian industry by breaking down technical and regulatory barriers to trade. It also plays a significant role in promoting the adoption of international standards and the recognition of conformity assessment results.

The department is also the home of the NMI, the body responsible for Australia's measurement standards and legal metrology.

Image: Electromagnetic Compatibility (EMC) Chamber. Courtesy of NMI.

The EMC Chamber tests whether petrol pumps perform correctly under the influence of emitted microwaves.

Structure and governance

The Department of Innovation is accountable to the Minister for Innovation, Industry, Science and Research and, through the Minister, to the Australian Parliament.

Operations

The Department of Innovation maintains policy oversight of Australia's technical infrastructure. This includes the administration of the Government's Memoranda of Understanding (MoUs) with Standards Australia and NATA and associated grants under the Support for Industry Service Organisations (SISO) Program.

The MoUs provide government recognition of Standards Australia and NATA as peak bodies within Australia and as the Australian members of key international standards and conformance bodies [e.g. International Organization for Standardization (ISO), International Electrotechnical Commission (IEC), International Laboratory Accreditation Cooperation (ILAC)]. The MOUs require these organisations to act in a way consistent with Australia's international obligations under the WTO TBT Agreement. In particular, standards should be based on international standards (where appropriate), conformity assessment test results should be accepted internationally and mutual recognition should be pursued internationally.

The SISO program is a long running initiative of the Australian Government. Its purpose is to ensure continuing Australian participation in and representation on, key international standards and conformance bodies. The SISO program delivers funding to Standards Australia and NATA to support this activity.

The department also plays a role in the governance of Standards Australia, NATA and JAS-ANZ via participation on the Standards Development Committee of Standards Australia, and the Boards of both NATA and JAS-ANZ.

International engagement

Mutual Recognition Arrangements/ Agreements (MRAs)

The Department of Innovation develops and manages government to government MRAs which provide for greater movement and ease of access of goods and services between nations. These MRAs have the potential to reduce the time and costs associated with exporting internationally.

The **European Community MRA (EC-MRA)** facilitates trade between Australia and the European Community by allowing conformity assessment of products traded between Europe and Australia to be undertaken in the Party of export rather than having to be undertaken at the destination. For Australian exporters this means that compliance with the relevant EC regulations can be completed prior to export. In this way products can be placed on EC markets without further intervention by EC authorities, potentially saving time and money.

The **Trans-Tasman Mutual Recognition Arrangement (TTMRA)** is an arrangement between Australia and New Zealand. The core of the arrangement is that goods that are able to be legally sold in Australia are able to be sold in New Zealand and vice versa - regardless of differences in standards or other sale-related regulatory requirements between Australia and New Zealand.

The TTMRA provides a simple, low cost and low maintenance mechanism for overcoming unnecessary regulatory impediments to the trade in goods. Benefits flowing from the TTMRA include:

- lower costs to business and improved competitiveness from being able to manufacture to a single standard;
- greater choice for consumers; and
- greater cooperation between regulatory authorities.

The Department of Innovation participates in the drafting and negotiation of Technical Barriers to Trade chapters for Free Trade Agreements (FTAs) and is responsible for the administration of these chapters in FTAs with the US and Chile.

The Department of Innovation is also responsible for the oversight and management of the Trans-Tasman, European Community (EC), European Free Trade Association (EFTA) and Singapore Mutual Recognition Arrangements/Agreements (MRAs). MRAs help to facilitate trade by reducing the need to duplicate product testing. This can reduce costs and improve 'time to market' for Australian exporters.

Regional cooperation

The Department of Innovation represents Australia on the Asia-Pacific Economic Cooperation Sub-Committee on Standards and Conformance (APEC SCSC). This sub-committee operates on the concept that the alignment of standards and conformance policies will facilitate international trade through reduced costs, more rapid trade flows and greater integration of production networks.

The sub-committee meets twice a year to discuss the key objectives pertaining to promoting greater harmonisation of international and national standards and consistency in conformance policies, promoting greater regulatory dialogue and open regionalism. Australia is an active member. Recent sub-committee outcomes include the establishment of the APEC Food Safety Cooperation Forum (FSCF) and the Wine Regulatory Forum which aim to harmonise relevant standards across the APEC region.

Contact details

Industry House, 10 Binara Street
CANBERRA ACT 2601
Tel: +61 2 6213 6000
Fax: +61 2 6213 7000
Email: TBT@innovation.gov.au
Postal address: GPO BOX 9839, Canberra ACT 2601

www.innovation.gov.au

Useful Links

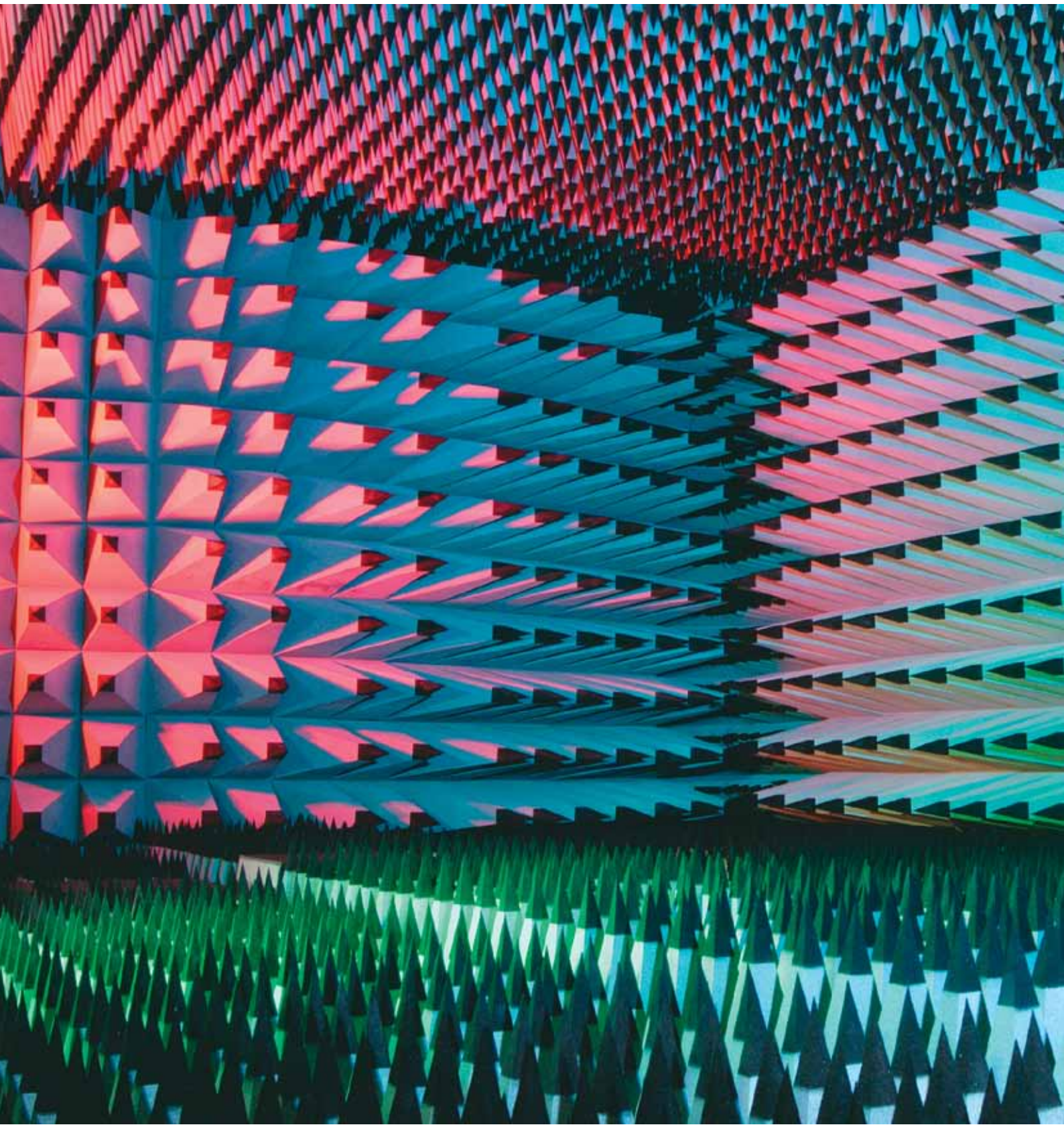
Trade Policy, Standards and Conformance
www.innovation.gov.au/Industry/TradePolicies/Pages/

Mutual Recognition Arrangements/Agreements
www.innovation.gov.au/Industry/TradePolicies/MRA/

Asia-Pacific Economic Cooperation Sub-Committee on Standards and Conformance (APEC SCSC)
www.apec.org/Home/Groups/Committee-on-Trade-and-Investment/Sub-Committee-on-Standards-and-Conformance

Australian Government

National Measurement Institute



National Measurement Institute

Role in the technical infrastructure

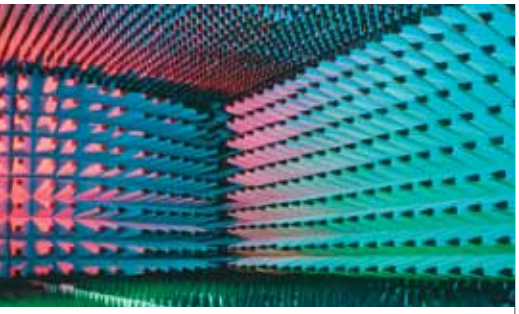


Image: The Anechoic Chamber. Courtesy of NMI.

The anechoic chamber is used to calibrate power density meters by exposure to electromagnetic waves. These meters are then used to check emissions from microwave ovens for conformity to Australian Standards

The National Measurement Institute (NMI) is responsible for the administration of the *National Measurement Act* and for advising the Australian Government on metrology issues.

NMI realises, develops, maintains and disseminates Australia's peak measurement standards for physical, chemical and biological measurement, conducts world class research into new measurement techniques, and is responsible for Australia's legal metrology framework. It also regulates the use of measuring instruments, such as petrol bowsers and supermarket scales, in domestic trade in Australia.

NMI ensures Australia's measurement standards are at a level comparable to those of its major trading partners and that industry, commerce, government authorities and the general community can have confidence in transactions based on measurement.

NMI supports the other elements of the standards and conformance infrastructure by contributing measurement expertise in relevant activities. For example, NMI experts work with the National Association of Testing Authorities (NATA) in accreditation of laboratories and proficiency testing. NMI experts are also members of Australia's delegations to the international documentary standards bodies, International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC), through Standards Australia.

Structure and governance

NMI is a division of the Department of Innovation and is accountable to the Minister for Innovation, Industry, Science and Research and, through the Minister, to the Australian Parliament. NMI's Chief Metrologist has functions conferred under the *National Measurement Act* and the National Measurement Regulations.

NMI was established on 1 July 2004 by bringing together three former agencies into one organisation responsible for the Australian Government's peak metrology functions.
On 1 July 2010, NMI became responsible for the national trade measurement system when the Commonwealth assumed responsibility for trade weights and measures from the States and Territories.

NMI has over 500 staff working in around 30 locations, including research laboratories at Lindfield, Pymble, Port Melbourne and Kensington, and trade measurement centres in every capital city other than Canberra.

Operations

NMI undertakes scientific research to keep measurement standards in step with the ever-increasing technological demand for accurate measurements. NMI also develops reference materials to meet the increasing demand for analysis and testing in the chemical and biological spheres.

NMI provides calibration and consultancy services for Australian industry, trade, defence and commerce, and provides measurement standards in support of environmental protection, health and safety.

It also provides pattern approval for measurement instruments. These include all types of weighing equipment and liquor, petrol, liquid petroleum gas and compressed natural gas dispensers.

NMI constantly aims to improve client satisfaction and productivity by monitoring key performance indicators including revenue, costs, and turn-around times. NMI also plays an active role in the development of measurement skills in industry, government and the community.

International engagement

NMI's Time Service

An Australian example of the application of measurement expertise relates to the accurate use of time by government and service industries such as major communications organisations, banking and transport systems. During the past 10 years, NMI and one of its predecessors have been developing, improving and installing systems for disseminating high accuracy time, traceable to national and international standards, onto the information technology (IT) networks of government and private organisations across Australia. Accurate timing underpins confidence in the integrity of transactions, correct operation of IT networks and security of IT infrastructure and data.

Genetic Testing

In its new bioanalysis area NMI has developed techniques to test for the presence of specific genetic material. Such techniques are highly relevant in such areas as the measurement of allergens in food, detecting the presence and concentration of genetically-modified food components, and the testing of athletes for the use of such banned techniques as blood doping. The same techniques also form the basis for the rapidly emerging generation of medical diagnostic and therapeutic processes based on genetic manipulation.

Illicit Drug Profiling

NMI has used its inventory of pure-substance chemical standards in the development of innovative software for the Australian Federal Police (AFP) that permits that body to identify the geographic source of illicit drug material seized while entering Australia. The capability has now been refined to such an extent that the AFP can even identify the particular valley in South America in which a seized sample originated. Such intelligence has proved invaluable for police operations.

Image: Coordinate Measuring Machine. Courtesy of NMI. The Coordinate Measuring Machine measures the physical dimensions of an engine block to high accuracy.

In the area of metrology, Australia is a signatory to the two inter-governmental treaties in measurement, the Convention of the Metre and the Convention of the International Organization for Legal Metrology (OIML).

NMI fulfils Australia's responsibilities under both of these treaties, providing expert representation in the peak scientific committees and activities of the International Committee for Weights and Measures (CIPM) established under the Metre Convention and the technical committees in legal metrology established under the OIML.

The participation of NMI experts in these peak global forums is important to maintaining the currency of NMI's expertise (including through international research collaboration), to ensure that Australia keeps abreast of international trends and drivers and to voice Australian interests and issues at these levels.

NMI is Australia's signatory to the international mutual recognition arrangements (MRA) established under both the Metre Treaty and the OIML Convention. These are the CIPM MRA and the OIML Mutual Acceptance Arrangement (MAA).

Under the CIPM MRA, signatories participate in a range of international measurement comparisons to demonstrate their capabilities. Signatories also submit their calibration and measurement capabilities for rigorous international peer review before publication in the international database that forms the technical basis of the CIPM MRA. NMI's participation in these activities ensures international credibility for Australia's measurement system and underpins testing and certification of traded products and services.

NMI is also an active participant in activities of the OIML, including development of model regulations for pattern approval of measuring instruments used for trade or regulatory purposes. OIML has established an international certification scheme as well as the OIML MAA for the international acceptance of test reports.

Regional cooperation

In the Asia-Pacific region, NMI is Australia's official representative to the two key regional metrology bodies, the Asia-Pacific Metrology Programme (APMP) and the Asia-Pacific Legal Metrology Forum (APLMF). These two bodies respectively coordinate the activities of regional national metrology institutes and legal metrology authorities. NMI participates at the governance level in both the APMP and APLMF.

Contact details

Headquarters, Sydney
Bradfield Road, Lindfield NSW 2070
Tel: +61 2 8467 3600
Fax: +61 2 8467 3610
Email: info@measurement.gov.au
Postal Address: PO BOX 264, Lindfield NSW 2070

www.measurement.gov.au

Useful Links

International Committee on Weights and Measures (CIPM)
www.bipm.org/en/committees/cipm

International Bureau of Weights and Measures (BIPM)
www.bipm.org

International Organization of Legal Metrology (OILM)
www.oiml.org

Asia-Pacific Legal Metrology Forum
www.aplmf.org

Asia Pacific Metrology Programme
www.apmpweb.org

Standards Australia

Role in the technical infrastructure

Standards Australia was established in 1922 and is the nation's peak standards organisation. It is charged by the Australian Government to meet Australia's need for contemporary, internationally aligned standards and related services. The work of Standards Australia enhances the nation's economic efficiency and international competitiveness and contributes to community demand for a safe and sustainable environment.

It leads and promotes a respected and unbiased standards development process ensuring all competing interests are heard, their points of view considered and consensus reached. Standards Australia works with international and specialist regional bodies and government on issues of conformance and assessment. Standards Australia's roles are recognised in its Memorandum of Understanding with the Australian Government.

Structure and governance

Standards Australia is a public company limited by guarantee. More than 70 of Australia's leading industry, government and consumer organisations form the Members of the Standards Australia Council. The Council has the responsibility to elect the Board of Directors and the Chairman, the Accreditation Board for Standards Development Organisations (ABSDO) and to appoint new members to the organisation. The Standards Australia Council is responsible for the general oversight of standardisation in Australia and the governance of Standards Australia.

Operations

Standards Australia facilitates and manages the development and maintenance of Australian Standards and other related solutions including Handbooks, Guides, Technical Specifications and Technical Reports.

Standards Australia does this by providing a neutral meeting ground and rigorous framework in which government, industry, consumer, academic, professional, community and employee bodies can discuss and debate issues with the aim of developing standards solutions.

The processes of Standards Australia are based on a balance of interest, transparency, openness and consensus. Standards Australia is also responsible for ensuring Australia's viewpoint is heard and considered in the development of International Standards and their subsequent adoption as Australian Standards.

Standards Australia is not part of government or a regulator and is not responsible for enforcing compliance or certification with Australian Standards.

Accreditation of Standards Development Organisations: Standards Australia supports the accreditation of other Standards Development Organisations through the ABSDO. This autonomous body independently assesses and approves other organisations such as industry associations to develop Australian Standards.

Standards Development: A range of development pathways are offered to stakeholders looking to develop or update standards (see **www.standards.org.au** for details).

International engagement

Standards Australia has international influence as the Australian Member of the world's most important standards organisations, the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

These organisations develop International Standards on which world markets and international conventions are based. They make trade between countries easier and fairer and are a safeguard for users and consumers, resulting in many aspects of our lives being made much simpler.

Regional cooperation

As part of the Closer Economic Relations agreement, Standards Australia maintains strong links with Standards New Zealand. Both are party to a formal agreement for preparing and publishing joint Australian/New Zealand Standards where appropriate. Standards Australia is a founding member of the Pacific Area Standards Congress (PASC), and also cooperates closely with the government in the standards and conformance activities of Asia-Pacific Economic Cooperation (APEC) and Association of Southwest Asian Nations - Australia New Zealand Free Trade Agreement (ASEAN-ANZFTA).

Contact details

Level 10, The Exchange Centre, 20 Bridge Street, Sydney
Tel: 1800 035 822 or + 61 2 9237 6171 (overseas)
Fax: +61 2 9237 6010 | Email: mail@standards.org.au
Postal Address: GPO BOX 476 Sydney NSW 2001

www.standards.org.au

Safety of Electrical Appliances

The product electrical safety standards prepared by International Electrotechnical Commission (IEC) TC 61 (IEC 60335 series) are extensively used by regulators worldwide as the safety criteria for electrical goods sold to consumers—a significant element of the global economy, and a major area of public safety.

These IEC standards, applied in Australia and New Zealand as AS/NZS 3350→AS/NZS 60335, form the technical basis of electrical product safety regulation, and hence comply with Australian WTO obligations in this area. Australia (and NZ) have had substantial success in IEC TC 61 via submission and representation.

This makes national adoption much easier (eg. acceptable fire tests for electrical appliances, and the acceptance by IEC TC 61 of the Australian standard for steaming appliances).

Australian participation is essential to maintain the high confidence level in IEC as the AS/NZS 3350 and AS/NZS 60335 series of standards are widely used by regulators in Australia.

Useful Links

International Organization for Standardization
www.iso.org

International Electrotechnical Commission (IEC)
www.iec.ch

Pacific Area Standards Congress (PASC)
www.pascnet.org

Do all products have to meet Australian Standards?

Image: JSF tooling. Courtesy of Marand Precision Engineering Pty Limited.

In Australia, standards can either be voluntary or mandatory. Compliance with Australian Standards (ie voluntary standards) is only legally required if they are referenced in regulation, legislation or in a contract.

Voluntary standards

Many organisations choose to comply with voluntary standards. Voluntary Standards are published documents setting out specifications and procedures designed to ensure products, services and systems are safe, reliable and consistently perform as intended. Voluntary standards establish a common language which defines quality and safety criteria. They facilitate trade and market exchange, and give more certainty to buyers and sellers trading products, helping to limit ambiguity over buyer requirements and product specifications.

Standards Australia has a catalogue of over 7000 Australian Standards, one third of which are referenced in Australian, State or Territory regulation. These cover everything from consumer products and services, construction, engineering, business, information technology, human services, energy and water utilities, to the environment.

Mandatory standards

Mandatory standards, for example, mandatory safety standards are made for products that are likely to be especially hazardous. In making mandatory safety standards, the government protects consumers by specifying minimum requirements that products must meet before they can be supplied. Safety standards require goods to comply with particular performance, composition, contents, methods of manufacture or processing, design, construction, finish or packaging rules.

When a government needs to establish minimum safety requirements, a voluntary standard often exists where experts have already identified ways to address a particular problem. The government may then make all or part of the voluntary standard mandatory via referencing in legislation.

Examples of mandatory Australian Standards include electrical safety (see **www.erac.gov.au**), consumer product safety standards (see **www.productsafety.gov.au**) and building and plumbing standards (see **www.abcb.gov.au**).

Compliance with Australian Standards

Where organisations make a claim of compliance with Australian Standards this must be sustainable. If an organisation falsely represents that its goods or services meet a certain standard this is likely to raise concerns under the misleading or deceptive conduct and misrepresentation provisions in the Australian Consumer Law. Where a claim is false or misleading consumers may make a complaint to the Australian Competition and Consumer Commission (ACCC) under the Australian Consumer Law (see **www.accc.gov.au/acl**) or State or Territory Fair Trading Offices.

Problems with products not meeting Australian Standards, as stipulated in a contract, for example, are usually a matter for the parties to the contract who have a general recourse to legal action.

Compliance with Australian Standards should not be confused with consumer guarantees that apply to all goods and services sold in Australia from 1 January 2011 under the Australian Consumer Law. Consumer guarantees include:

- goods will be of acceptable quality;
- goods will be fit for any disclosed purpose;
- goods will match their description;
- goods will match the sample or demonstration model;
- any express warranties will be honoured;
- spare parts and repair facilities will be available for a reasonable time; and
- services must be provided with care and skill, be fit for any disclosed purpose and achieve any disclosed result.

For more information about the Australian Consumer Law see **www.accc.gov.au/acl**

National Association of Testing Authorities

Role in the technical infrastructure

The National Association of Testing Authorities (NATA) is a key organisation in Australia's standards and conformance infrastructure developing knowledge, international experience, and recognition in accreditation of inspection bodies, testing and measurement.

NATA is the national compliance monitoring authority for facilities performing studies in accordance with the Organisation for Economic Cooperation and Development (OECD) principles of Good Laboratory Practice. The Australian Government recognises these roles in a Memorandum of Understanding with NATA.

Structure and governance

NATA was established in 1947 by the Australian Government with support from the States as the first comprehensive laboratory accreditation system in the world. It is an independent, private, not-for-profit company, operating as an Association and owned by its members. All NATA accredited organisations are members of the Association.

NATA is guided and monitored by a Board elected from its Council. The Council consists of elected Association members and representatives from industry, government and professional bodies.

NATA operates a number of technical advisory committees, with membership drawn from accredited facilities, professional bodies, academic institutions, regulators and other stakeholders.

NATA undergoes regular on-site evaluation by its international peers to ensure its ongoing competence and capability to deliver credible accreditation consistent with international practices.

Operations

NATA accredits facilities for technical competence in a comprehensive range of industry groups and professions and can develop programs to suit specific regulatory or stakeholder needs.

A cornerstone of NATA accreditation is its use of peer group technical experts as members of a laboratory assessment team. NATA has access to nearly 3000 technical experts who volunteer their time to accompany the Association's scientific staff to evaluate the technical competence of applicant and accredited facilities. Currently, the key areas of operations are:

Laboratory accreditation: Laboratory accreditation provides a means of determining and recognising the competence of laboratories to perform specific types of testing, measurement and calibration, and related activities such as sampling. It is available to both in-house and independent laboratories.

Inspection accreditation: Inspection involves "examination of a product design, product, service, process or plant and determination of its conformity with specific criteria or, on the basis of professional judgement, general requirements" (AS/NZS ISO/EC 17020:2000). Inspection accreditation can be utilised in industry, by regulatory authorities and by the wider community. The types of inspection covered by NATA are diverse.

Approval for providers of proficiency testing schemes: NATA operates a program for accrediting proficiency testing (PT) scheme providers consistent with ISO/IEC 17043:2010,

Accreditation of reference material producers: One of the main factors affecting laboratories' capabilities to produce reliable test data is the availability of reference materials with certified values that can be relied upon by their users. The use of certified reference materials (CRM) and/or reference materials (RM) in testing and calibration laboratories is critical for ensuring that any established traceability chain to SI units is unbroken.

Other Areas of Accreditation: NATA also currently offers accreditation for medical imaging practices, research and development facilities, and clinical services such as sleep disorder facilities.

Training and seminar services: NATA offers public and tailored in-house training programs in Australia and internationally.

Public database of NATA accredited laboratories: NATA maintains a database of its accredited facilities, including their scopes of accreditation. This is particularly useful for organisations seeking laboratories able to undertake specific tests, measurements or inspections.

NATA publications: NATA publishes a range of technical and information documents covering laboratory and inspection practice and evaluation.

International engagement

NATA accreditation of energy efficiency testing laboratories

NATA-accredited energy efficiency testing laboratories are used by the various state regulatory authorities to conduct "check testing" programs (market surveillance) on electrical appliances and equipment that have to meet minimum energy performance standards to be legally placed on the market. To consumers, the most visible aspect of these requirements are the "star ratings" one might see on a refrigerator or washing machine.

To ensure that purchasers are getting what they typically have to pay more for – the more stars, the lower the running costs – regulatory authorities arrange for the purchase of off-the-shelf appliances and have them retested in an appropriately accredited laboratory. Should the tested product not meet its labelled rating, a range of penalties can be, and are, applied to the supplier which may involve paying compensation to purchasers.

NATA's experience in the on-site peer assessment of these laboratories has resulted in suggested improvements to the applicable standards being fed back into Standards Australia's processes further enhancing the confidence in the labelling scheme.

NATA actively promotes its accredited laboratories within Australia and internationally. It is an active participant in the International Laboratory Accreditation Cooperation (ILAC).

NATA also represents Australia in other international fora such as International Bureau of Weights and Measures (BIPM)/ International Organization of Legal Metrology (OIML), International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC), International Accreditation Forum (IAF), and the World Trade Organization (WTO). NATA is a signatory to mutual recognition arrangements covering over 70 other laboratory accreditation bodies in 58 economies. These agreements are crucial in the recognition of Australian test and calibration data overseas, and acceptance of Australian goods in foreign markets.

NATA's staff provide input into a number of international committees such as ISO/Committee on Conformity Assessment (CASCO), ISO/Committe on Reference Materials (REMCO), International Union of Pure and Applied Chemistry (IUPAC) and the OECD Panel on Good Laboratory Practice. In addition to accreditation of over 2,500 Australian laboratories, NATA has accredited more than 40 overseas laboratories.

NATA has a long history in providing consultancy services for developing laboratory accreditation bodies around the globe and can train staff, both offshore and through attachment in Australia.

Regional cooperation

NATA is one of the founding members of the Asia-Pacific Laboratory Accreditation Cooperation (APLAC), which is a cooperation between the various laboratory accreditation bodies in the Asia-Pacific region. NATA also operates the APLAC secretariat.

NATA regularly hosts delegations from Asia-Pacific countries and from other regions keen to learn more from the extensive experience this association has gained in accreditation and related activities.

Contact details

Head Office
7 Leeds Street, Rhodes NSW 2138
Tel: 1800 621 666
Fax: +61 2 9743 5311
Postal Address: PO BOX 7507, Silverwater NSW 2128

www.nata.com.au

Useful Links

International Laboratory Accreditation Cooperation (ILAC)
www.ilac.org

Asia-Pacific Laboratory Accreditation Cooperation (APLAC)
www.aplac.org

JAS-ANZ

Joint Accreditation System of Australia and New Zealand

Role in the technical infrastructure

What is ISO 9000?

ISO 9000 is a family of standards related to quality management systems (QMS) that are designed to help organisations ensure they meet the needs of customers and other stakeholders. QMS are a remarkably durable methodology around which to structure many different forms of business operation. ISO 9001 has been adapted to a systematic approach to managing production output, process improvement, customer satisfaction and organisational risk. This illustrates that ISO 9001 remains a fundamentally sound approach to the most enduring of organisational problems – managing the relationships between inputs and processes and outputs.

ISO 9001 describes the fundamentals and requirements of quality management systems. It is also a foundation for other more topical systems such as Environmental Management, Food Safety Management, Occupational Health and Safety Management and Risk Management. The ISO 9001 standard does not attempt to measure the quality of the products or services of companies; they make no reference to specific objectives or results. That is the role of business strategy. What the standards do is to provide a platform on which the pursuit of business objectives or results can be systematised and a method by which to formalise company tasks so as to produce products, or services that meet customer demands.

Recent work undertaken by Monash University's, Australian Supply Chain Management Research Unit (ASCMRU) in the Faculty of Business and Economics, highlights that implementing ISO 9001 improves internal and external business performances. These results indicate the enduring market value of the ISO 9001 certification both internally and externally in enhancing the image of companies for their customers and improving managerial policies and procedures.

The Joint Accreditation System of Australia and New Zealand (JAS-ANZ) was established by Treaty in 1991 by the Australian and New Zealand governments to strengthen the trading relationship between the two countries and with other countries.

The JAS-ANZ Treaty established the Governing Board, Technical Advisory Council and Accreditation Review Board. The Treaty requires JAS-ANZ to operate a joint accreditation system and to deliver on four goals relating to Integrity and Confidence, Trade Support, Linkages, and International Acceptance, which are outlined below.

Accreditation of conformity assessment bodies, on the basis of assessments undertaken on behalf of the Governing Board, enhances their status and authority both nationally and internationally and strengthens the international competitiveness of Australian and New Zealand industry.

Accreditation is a measure of the competence and impartiality of Certification and Inspection Bodies. It enables users to have confidence in certificates of conformance that they issue.

Structure and Governance

JAS-ANZ operates on a not-for-profit basis. Under the formal direction of a Governing Board, the Technical Advisory Council and Accreditation Review Board support the development and implementation of policies and principles that underpin the operation of the joint accreditation system. The Technical Advisory Council represents stakeholder interests and the Accreditation Review Board provides expert and impartial decisions in relation to granting, maintaining, reducing, extending, suspending and withdrawing accreditation.

JAS-ANZ takes its direction from four goals that reflect the intention of JAS-ANZ's principal stakeholders in establishing the organisation. They remain the foundation for the direction of the organisation.

Integrity and Confidence: To maintain a joint accreditation system that will give users confidence that goods and services certified by accredited bodies meet established standards. Confidence is one of the enabling values of accreditation.

Trade Support: To obtain and maintain acceptance by Australia's and New Zealand's trading partners of domestic management systems and exported goods and services. Well-structured conformity assessment mechanisms support the flow of goods and services.

Linkages: To link with relevant bodies which establish or recognise standards for goods and services or which provide conformity assessment. Linkages provide the channels for JAS-ANZ to maintain a world class system of accreditation. Through these linkages, JAS-ANZ can influence outcomes in international and national standards and guidance on conformity assessment so that Australian and New Zealand interests are not disadvantaged.

International Acceptance: To obtain mutual recognition and acceptance of conformity assessment with relevant bodies in other countries. Mutual Recognition Arrangements/Agreements (MRAs) and Multilateral Recognition Arrangements (MLAs) deliver a systematic framework for acceptance of conformity assessment results between trading nations.

JAS-ANZ has formal obligations to account for its activities to the Australian and New Zealand governments through forward planning and reporting against those plans. Through a network of international ties JAS-ANZ is subject to periodic peer review. JAS-ANZ has a secretariat of 20 to assist the Governing Board fulfil its obligations.

Food safe for Human Consumption

Joint Accreditation System of Australia and New Zealand (JAS-ANZ) plays a significant role in helping to ensure that food is safe for human consumption. JAS-ANZ accredits Certification and Inspection Bodies that audit and inspect organisations across the food supply chain from farming to retail. The accreditation process positively influences food safety in a number of ways. JAS-ANZ evaluates a scheme before introducing it into the accreditation system. This evaluation covers a number of factors including assessing whether the standard is suitable for certification or inspection, and whether the scheme has been developed in an open and transparent way. JAS-ANZ works with scheme owners in the ongoing maintenance of these schemes. Through the accreditation process, JAS-ANZ ensures that Certification and Inspection Bodies are competent and impartial in the conduct of their certification and inspection activities.

JAS-ANZ ensures high standards are maintained through ongoing surveillance. Globally there are a wide range of regulatory, voluntary and private standards that contribute to food safety. Regulatory standards must be met before food can be sold. Voluntary standards such as AS ISO 22000 are adopted by industry members to effectively manage and demonstrate their food safety capabilities. Private standards are set by supplier and retail groups as a condition of supply. From a global perspective regulatory, voluntary and private standards provide multiple layers of overlapping requirements.

Image: courtesy of La Casa del Formaggio.

Operations

JAS-ANZ activities are structured around five distinct disciplines or programs: management systems certification, product certification, personnel certification, inspection, and greenhouse gas validation and verification.

Under these five programs, JAS-ANZ recognises 125 public and proprietary schemes that have been developed by or in conjunction with public authorities and industry groups. The schemes provide a level of confidence to support exchange of products and services across a wide range of industry sectors.

Over 90 certification and inspection bodies are accredited, with the largest number concentrated in management systems. Over 70,000 accredited certificates are issued in over 80 countries to address the need for authoritative attestations of conformity.

A high proportion of JAS-ANZ's effort centres on five areas of economic and social activity:

- Business Processes and Innovation;
- Health and Human Services;
- Food and Biological Systems;
- Product Performance and Safety; and
- Environmental Management.

JAS-ANZ's operations also extend to providing technical support for the development of infrastructure capabilities in developing nations; current projects involve Laos and Cambodia.

International engagement

A key role for JAS-ANZ is establishing international arrangements with other countries to accept one another's certificates and inspection reports so removing a technical barrier to trade. JAS-ANZ supports overcoming technical barriers to trade by ensuring its accreditation programs and schemes keep pace with modern conformity assessment trends. An important mechanism for this is membership in international organisations which provide the framework of multilateral agreements (MLAs) under which signatories will recognise one another's accredited certificates and inspection reports.

JAS-ANZ is a founding member of the International Accreditation Forum (IAF), and a signatory to the IAF MLAs for quality management systems, environmental management systems, and product certification.

JAS-ANZ is an active member of the key accreditation organisations including the IAF, the Pacific Accreditation Cooperation (PAC), and the Asia Pacific Laboratory Accreditation Cooperation (APLAC).

JAS-ANZ is also a member of the Multilateral Cooperative Accreditation Arrangement (MCAA), a collaborative arrangement between a number of international accreditation bodies that facilitates the sharing of information relating to signatory accredited bodies and cooperation in the servicing of these bodies.

The benefit of this work is that it reduces the potential for re-certification or re-inspection when products and services move from one country to another.

Contact details

Level 1, Members Equity Bank Building
11 London Circuit
Canberra ACT 2600
Tel: +61 2 6232 2000
Fax: +61 2 6262 7980
Postal Address: GPO BOX 170, Canberra ACT 2601
Email: contact@jas-anz.org

www.jas-anz.org

Useful links

International Accreditation Forum (IAF)
www.iaf.nu

Pacific Accreditation Cooperation (PAC)
www.apec-pac.org

Abbreviations

ABSDO – Accreditation Board for Standards Development Organisations
ACCC – Australian Competition and Consumer Commission
AFP – Australian Federal Police
APEC – Asia-Pacific Economic Cooperation
APEC SCSC – APEC Sub-Committee on Standards and Conformance
APLAC – Asia Pacific Laboratory Accreditation Cooperation
APLMF – Asia-Pacific Legal Metrology Forum
APMP – Asia Pacific Metrology Programme
ASEAN – Association of Southeast Asian Nations
ASEAN-ANZFTA - Association of Southeast Asian Nations – Australia New Zealand Free Trade Agreement
BIPM – International Bureau of Weights and Measures
CAB – Conformity Assessment Body
CIPM – International Committee for Weights and Measures
CRM – Certified Reference Materials
EC – European Community
EC MRA – Agreement on Mutual Recognition in relation to Conformity Assessment, Certificates and Markings between Australia and the European Community
EFTA – European Free Trade Association
EU – European Union
FTA – Free Trade Agreement
FSCF – Food Safety Cooperation Forum
IAF – International Accreditation Forum
IEC – International Electrotechnical Commission
ILAC – International Laboratory Accreditation Cooperation
ISO – International Organization for Standardization
ISO-CASCO – International Organization for Standardization-Committee on Conformity Assessment
ISO-REMCO – International Organization for Standardization-Committee on Reference Materials
IT – Information Technology
IUPAC – International Union of Pure and Applied Chemistry
JAS-ANZ – Joint Accreditation System of Australia and New Zealand
MAA – Mutual Acceptance Arrangement
MCAA – Multilateral Cooperative Accreditation Arrangement
MLA – Multilateral Recognition Arrangement
MoU – Memorandum of Understanding
MRA – Mutual Recognition Arrangement/Agreement
NATA – National Association of Testing Authorities
NMI – National Measurement Institute
OECD – Organisation for Economic Co-operation and Development
OIML – International Organization of Legal Metrology
PAC – Pacific Accreditation Cooperation
PASC – Pacific Area Standards Congress
PT – Proficiency Testing
RM – Reference Materials
SI – International System of Units
SISO – Support for Industry Service Organisations
SRB – Specialist Regional Bodies
TBT – Technical Barriers to Trade
TTMRA – Trans-Tasman Mutual Recognition Arrangement
WTO – World Trade Organization

Australian Government
National Measurement Institute

STANDARDS Australia

NATA

JAS-ANZ