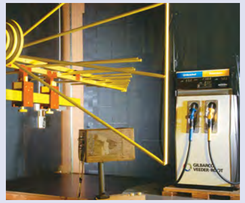


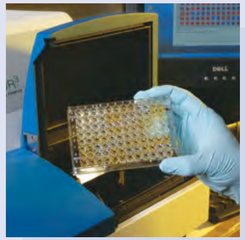
Petrol bowsers need to be examined for compliance to specifications. One of the tests is to ensure that their measurements are not susceptible to electromagnetic interference.

NOVEL PRODUCTS

NMI's products serve the needs of a range of clients: commercial testing providers, service industries, research institutes and other national metrology institutes. Some of our more novel products are:

- international best-practice certified reference materials to facilitate accurate analyses in laboratories: sports drugs, forensic drugs, agricultural and veterinary chemicals are our specialties.
- specialised high accuracy time and frequency dissemination systems serving the needs of a wide range of clients, including the national 'Speaking Clock' service.
- training programs in measurement and uncertainty analysis, tailored to particular sectors of industry.

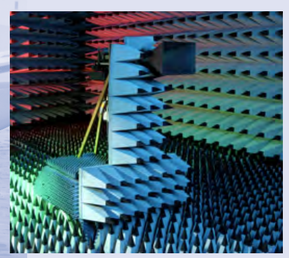
Drug testing laboratories, NMI included, use antibody-based tests such as this ELISA plate to detect the abuse of protein-based drugs such as EPO and hGH in athletes.



ENABLING SERVICES

NMI's broad suite of measurement expertise is available to government, industry and the community through a wide variety of services delivered by our laboratories across Australia. Issuing over 15 000 test and measurement reports a year to approximately 5 000 clients, NMI is well-placed to deliver customised analytical and calibration services such as:

- determination of food contaminants, agrichemical residues, functional components and food safety indicators.
- calibration of high accuracy measurements demonstrating traceability to the international system of units (SI).
- testing of measuring instruments under fluctuating environmental conditions to ensure that they perform to specifications.
- proficiency testing programs in target areas of public concern: trade, public health, law enforcement and the environment.
- chemical analyses for organic and inorganic pollutants to meet statutory requirements, including specialised facilities for providing high accuracy reference values, low-level and speciation analysis.
- development of new measuring instruments, systems and solutions to meet industrial and scientific needs.
- measurement of nanoparticle size, size distribution and shape.



The radio anechoic chamber calibrates standard antennas, field probes and power density meters, which are in turn used to calibrate telecom and defence antennas and measure emission levels from electrical instruments.

Australian Government
National Measurement Institute

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Australian Government
National Measurement Institute

NATIONAL MEASUREMENT INSTITUTE

WORLD-CLASS MEASUREMENT STANDARDS AND SERVICES FOR AUSTRALIA

measurement.gov.au

ABOUT NMI

The National Measurement Institute is Australia's peak measurement organisation, responsible for the national measurement infrastructure and for maintaining Australia's primary standards of measurement. Currently employing about 360 people on 5 sites across Australia, NMI is the only 'one-stop shop' for all disciplines of measurement in Australia – analytical, biological, chemical, legal and physical.

WHAT WE DO

NMI carries out in-depth research programs and provides the legal and technical framework for disseminating measurement standards for the Australian economy. Working with industry and government, it provides measurement expertise, calibration services, chemical and biological analyses and pattern approval testing. NMI works to support Australia's standards and conformance infrastructure.

OUR VISION

To deliver a facility for measurement in Australia that is world-class, increases industrial efficiency, enhances export trade, supports sound regulation and effective social and health policies.

OUR EXCITING FUTURE

On 1 July 2010, NMI assumed responsibility for trade measurement under a national system. Trade measurement ensures that transactions in which the value of a good is determined by measurement are fair and equitable. Petrol pumps, retail scales and weighbridges are all measuring instruments that the public and businesses rely on everyday to be accurate and fit-for-purpose. Four hundred billion dollars a year in trade transactions are dependent on measurement. In taking responsibility for the regulation of all trade measuring instruments across the country, NMI will be the sole measurement authority in Australia.

OUR PROMISE

A comprehensive, multi-faceted approach to your measurement challenge. Based on a combination of expertise, international experience and synergies generated from a multi-disciplinary approach to measurement together with state-of-the-art instrumentation.

INNOVATIVE RESEARCH

Research underpins all aspects of NMI's work. High-level research and collaborations deliver scientific return on investment, international credibility for measurements made in Australia, and provide support for emerging technologies. Research activities include:

- participating in international collaborations aimed at improving the definition of the kilogram, the accuracy of time and frequency measurements, and the standard of direct voltage.
- developing leading-edge approaches to improve the accuracy of DNA and RNA measurements for clinical and veterinary diagnostics.
- developing improved detection methods and producing chemical reference materials to underpin the accuracy of measurements of performance-enhancing drugs in athletes. Development of techniques for detecting gene doping is a priority.
- improving accuracy of physical measurement standards and techniques that are essential to advances in technology and products.
- emerging areas such as food allergens, genetically modified organisms, designer illicit drugs, newly identified pollutants and greenhouse gases which require new analytical methods and reference materials. We are working with our partners towards those goals.

NMI's high voltage laboratory at Lindfield, Sydney, is Australia's largest high voltage hall.

Blocks of illicit drugs seized by the Australian Federal Police have to be broken down and homogenized prior to analysis. (Photo: AFP Forensic and Data Centres)

COLLABORATIVE PARTNERSHIPS

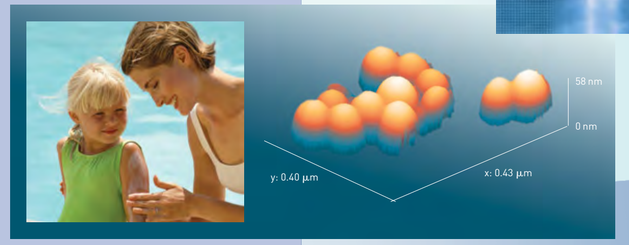
Partnerships with other organisations are essential to NMI's ability to serve Australia's interests effectively. These partnerships range from multi-lateral scientific collaborations to work conducted under contract. Transfer of expertise and technology to industry is facilitated. Some examples are:

- working with the National Water Commission on a metering framework for suppliers and users of irrigation water. Adequate legal validity to underpin extraction and trading regimes of irrigation water is important.
- advising the National Textile Clothing & Footware Industries Innovation Council on standards for clothing sizes and a proposed anthropomorphic study of the Australian population.
- working with the WA Water Corporation to characterise treated wastewater and its subsequent injection into the depleted aquifer of the Gnangara Mound in WA. NMI provides continual support in method development, validation, measurement uncertainty and QA/QC.
- a new standard for alternating current (AC) voltage is being jointly developed by NMI and the National Institute of Advanced Industrial Science and Technology, Japan. The new standard will lead to increased accuracy and reliability of AC voltage measurement and, consequently, alternating current and power.
- working with international metrology institutes on new, highly accurate methods and instruments for measuring dimensions of nanoparticles.
- conducting chemical profiling of illicit drugs and providing information about geographical origin, trafficking routes and chemicals used in production, thereby assisting law enforcement agencies with strategic intelligence to restrict the illicit drug trade in Australia.

The Gnangara Mound is the single most important source of potable water for Perth and stretches from Gingin in the north to the Swan River in the south. It supplies up to 60% of Perth's drinking water

A new irrigation metering system being tested. Together with the water industry, NMI has developed a new irrigation meter standard to help manufacturers and users ensure consumption of irrigation water is measured accurately. (Photo: AWMA Pty Ltd)

Nanoparticles of zinc oxide in zinc creams make them invisible. Materials at different sizes have different physical properties that can make them beneficial or harmful. NMI's nanoparticle laboratory can ensure that size of particles is accurate.



An image of 50 nanometre latex particles taken by NMI's nanoparticle laboratory. Particles such as these are used to calibrate particle sizing instruments.

SPECIALIST CAPABILITIES

NMI offers a broad range of scientific and technical capabilities that address all sectors of measurement at the highest levels of precision and integrity. Our capabilities in action include:

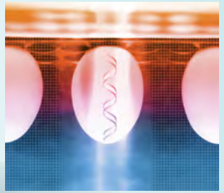
- a high-voltage laboratory to test a wide range of precision instrumentation and major infrastructure used in power generation and distribution.
- dissemination of accurate time into ICT systems and remote operation of time servers on clients' infrastructures.
- running a key laboratory for analysis of vitamins and functional components of food and beverages e.g. total antioxidant capacity of juices.
- ultra-trace analysis of dioxins and other persistent organic pollutants at parts per trillion levels to underpin surveys of Australia's air, water, soil, flora, fauna and food.

NMI regularly analyses fish for dioxins and has analysed fish caught in Sydney Harbour for ultra low levels of dioxin.

GROWTH INTO THE FUTURE

NMI undertakes cutting-edge research to anticipate trends in new measurement technologies. This research is the foundation of our contribution to Australian Government priorities such as climate change, water management and nanotechnology. NMI will pursue opportunities to provide policy and practical measurement advice to a number of government agencies to enhance their application of fit-for-purpose measurements in important areas such as the environment, resource management, climate change mitigation, health, food safety and biosecurity. Growth areas include:

- NMI's nanoparticles work helps industry and regulators understand and manage potential risks associated with the nanotechnology industry, thereby supporting the global competitiveness of a rapidly growing industry in Australia.
- developing fit-for-purpose measurements of greenhouse gases to address national needs in areas such as carbon pollution reduction.
- working with stakeholders to provide greater certainty in measurement of the quality and volume of water.



NMI is developing novel measuring systems to quantify DNA and RNA, thereby linking these measurements to SI units. This can then be used to support the development of medical diagnostics for some cancers.