



Defence and aerospace

Industry capabilities



About ANSTO

ANSTO is home to Australia's most important landmark research infrastructure and expertise in nuclear science and technology. Drawing on more than sixty years of research on materials, from the time it operated under the auspices of the Australian Atomic Energy Commission, ANSTO has evolved to provide a unique set of facilities and expertise that support the requirements of the advanced manufacturing, materials and defence sector.

Every year thousands of Australian researchers from industry, collaborating organisations and academia use ANSTO's infrastructure and capabilities which draw on the deep expertise of our staff.

ANSTO infrastructure



OPAL multi-purpose reactor



Australian Centre for Neutron Scattering



Centre for Accelerator Science



Australian Synchrotron



Facilities to characterise and develop nuclear materials



Gamma Technology Research Irradiator

Our people

People at ANSTO include expert scientists, engineers and technicians who contribute to industrial and translational research, collaborate with world leading authorities and foster promising early career professionals.

Collaboration and connection are pivotal to the best translational research outcomes. ANSTO has strong academic and commercial connections with all public research organisations currently supporting the delivery of goods, services and advice to the defence sector in Australia.



As a founding core participant in DMTC, ANSTO supports the Australian Defence Force and Australian Defence Industry by providing access to scientific research infrastructure and expertise in materials engineering and advanced manufacturing.

Our capabilities

1 Engineering

2 Manufacturing

3 Materials

4 Radiation testing

5 Innovative products

1. Engineering

Engineering of critical components subject to complex or extreme conditions is an area of expertise that has made ANSTO an authority in the development and operation of nuclear technologies.

Critical weld failure

CHALLENGE:

Predict weld failure in critical components.

SOLUTION:

Non-invasive residual stress analysis using neutron scattering.



Modelling armour and blast resistance

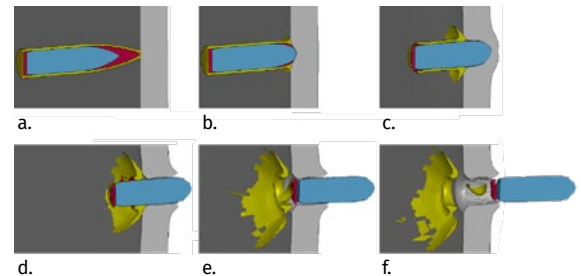
DST Group

CHALLENGE:

Accelerate armour development.

SOLUTION:

Sophisticated computer and measurement-validated simulations.



2. Manufacturing

Manufacturing techniques for advanced materials can greatly benefit from the specialised knowledge and facilities available at ANSTO. ANSTO's experience in developing waste encapsulation technology can be applied to provide new solutions, such as manufacturing the most advanced piezoelectric materials for new SONAR applications or utilising the most sophisticated Hot Isostatic Pressing (HIP) facility in Australia to strengthen 3D printed components.

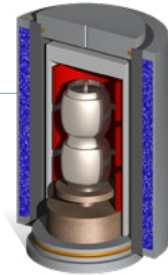
Advance metal and ceramic components

CHALLENGE:

Optimise strength in sintered material.

SOLUTION:

Improving material performance with HIP at ANSTO Synroc®.



Novel sensor materials for submarines

DST Group | Thales

CHALLENGE:

Develop next-gen transducers for SONAR.

SOLUTION:

Innovate new piezo-ceramic materials.



3. Materials

Materials at the most basic level determine what a component can do and how long it will last. The Australian Centre for Neutron Scattering and the Australian Synchrotron provide tools that can help solve problems with materials when more conventional testing techniques are inadequate.

Understanding why a polymer composite is degrading, how a metallic coating can be improved for longer life or when a complex 3D component build is failing can be approached using infrared, X-ray and neutron techniques.

Laser cladding metal surface

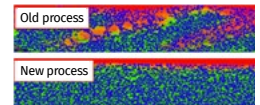
Laserbond

CHALLENGE:

Assess new process.

SOLUTION:

Synchrotron elemental mapping of alloy and parent metals in coating.



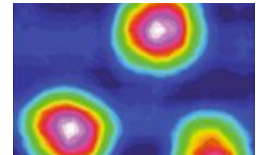
Carbon fibre manufacturing

CHALLENGE:

Improve pre-carbonised fibre.

SOLUTION:

Synchrotron mapping of chemical bonds.



Complex 3D metal printing

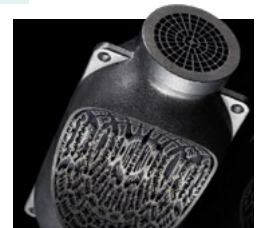
Conflux

CHALLENGE:

Improve 3D print.

SOLUTION:

Synchrotron 3D X-ray imaging at high resolution for non-destructive internal inspection and process.



4. Radiation testing

Radiation testing of electronic components and systems is undertaken to gauge their suitability for satellites in orbit and deeper space missions exposed to solar particles and cosmic radiation. Techniques using high energy ion beams, gamma-rays, high-energy X-rays, as well as slow and fast neutron irradiation, simulate effects of space radiation. New offerings for SMEs in the defence sector are being developed in this area.



5. Innovative products

The CORIS360® imaging system provides 360° gamma-ray imaging for quick accurate assessment of unknown radiological environments.



Quickly detect, identify and locate RN threats



360° × 90° wide field of view



Improve decision making



Enhance security



Neutron detection



Nuclear technologies: Advice and training

ANSTO expertise encompasses all aspects of the nuclear fuel cycle from the mining of uranium to ultimate waste solutions.

Scientists at ANSTO address key scientific questions related to both the current generation of nuclear reactors and future systems. Expertise and capabilities are applied to investigations of fuel, spent fuel and nuclear technologies, including next-generation systems.

As a leader in radiological measurement and understanding the impact of nuclear activities on the surrounding environment, ANSTO contributes to Australian, regional and international monitoring. Research strategies and obligations in environmental monitoring also support Australia's nuclear emergency preparedness and response, nuclear security and safety.

The Nuclear Stewardship science group undertakes activities in Radioactivity measurement standards, Radioanalytical chemistry, Nuclear security science, Environmental monitoring and operates the Environmental Radioactivity Measurement Centre.

ANSTO's Radiation Services and Waste Management teams comprise more than 50 experts; many of whom have lifelong experience and are national authorities. With safety driving all processes, ANSTO provides consultation services to government and industry, developing strategic partnerships and delivering solutions for source inventory management, radiation safety education and radioactive waste.

Specialist training services provide frontline responders with the tools to operate in hazardous radiological environments. Partnering with government agencies enhances interoperability in response. The interface between frontline responders and scientists ensures the latest technology developments strengthen Australia's ability to prepare strategic responses to extreme threats.

Collaboration

ANSTO enjoys the best of both worlds – secure and ISO accredited research sites, as well as long-standing collaboration with DST, CSIRO and Australian Universities. Security and intellectual property protection are a vital component of all business operations at ANSTO.

ANSTO can also accommodate work requiring Australian Government Security Vetting Agency (AGSVA) clearances.

A fundamental commitment to collaboration with industry and academia keeps ANSTO relevant. The ANSTO Innovation Precinct co-locates a community of industrial users with proximity and access to ANSTO scientists and infrastructure at Lucas Heights, NSW. The *nandin* deep tech incubator is home to a community of researchers, students and startup companies working on challenges relevant to the defence sector.

To complement this, the ANSTO Graduate Institute will further assist early career talent in Australia by co-developing graduate projects with Australian universities and other partners. Opportunities for student scholarships and joint supervision of student projects exist.





Australian Government



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Location

NSW campus

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VIC campus

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