

## **Materials for Defence: Opportunities for additive manufacturing**

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### **Abstract**

Military systems are becoming ever more complex, and so are the materials used to build them. In this context, advanced materials have sparked considerable interest as their use has the potential to significantly shape future operational effectiveness in military missions.

Advanced materials can be used in a wide range of domains and hostile environments where risks and damages can be reduced with the use of protective solutions. The most disruptive effects are expected to derive from the integration of functionalities such as energy harvesting, camouflage, structural and health monitoring, protection in 'multi-functional' materials for platforms and soldiers.

The major land, sea and air platforms currently in service are not expected to be retired for another two to three decades which means that the existing platforms will have to be upgraded with new materials. As a consequence, new opportunities for the implementation of new materials will most certainly arise through mid-life upgrades, incremental improvements, urgent operational needs, lifetime extension and a growing need for sovereign industry technological and material capability. These materials will make platforms and soldier systems lighter and better performing, while at the same time reducing their maintenance periods and cost. The incremental adaptations of platforms should not be the only aim as new technologies such as unmanned aerial vehicles, high speed systems, advanced sensors and emerging directed energy weapons (DEW) are maturing rapidly, and will need new materials to enhance their capabilities or to counter-measure them with new protections.

Building on AUS strong foundation of research, talented people and partners in government, academia and industry what materials S&T opportunities exist to assist Defence in the being the first to field a decisive capability. How does Defence ensure the AUS S&T community is aligned, allocated the funding and rapidly integrating the technology.