

NATO Capability Statement

Seshat's Composites

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Commercial Provider

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Product Overview

Seshat's Composites are next-generation, hemp-derived carbon nanomaterials engineered for use in high-performance military and aerospace applications. Combining tailored carbon allotropes with a renewable hemp oil binder, these composites offer superior strength, conductivity, and resilience—at a fraction of the cost and environmental impact of traditional materials.

Key Carbon Allotropes in Formulation

- **Amorphous Hemp Carbon (AHC)** – high surface area and tunable porosity
- **Graphitic Hemp Carbon** – turbostratic structures for strength and thermal conductivity
- **Hemp-Based Graphene-Like Sheets** – 1–5 layer carbon nanosheets
- **Carbon Nano-Onions (CNOs)** – multi-layered spherical fullerenes
- **Carbon Nanotubes (CNTs)** – tubular structures for impact and tensile performance
- **Hard Hemp Carbon** – battery-grade and high-compression compatible
- **Activated Hemp Carbon** – EMI shielding and radar absorbent coatings
- **Mesoporous Hemp Carbon (MHC)** – breathable and catalytic applications
- **Hemp Carbon Aerogels/Foams** – ultralight insulation and stealth tech

Technical Advantages

- Exceptional tensile strength and impact resistance
- Thermal and electrical conductivity for electronic and stealth integration
- Lightweight: up to 10× lighter than steel, 50% lighter than aramid fiber
- Corrosion-proof and moisture-resistant
- Non-toxic, biodegradable, and produced with net-negative carbon emissions
- Estimated cost: 10–50× less than petroleum-based nanomaterials

Military Applications

- Ballistic body armor, helmets, and shields
- UAVs and aircraft fuselage components
- Armored boats and submarine hulls
- EMI/EMP shielding and camouflage coatings
- Smart wearable fabrics and biosensors
- Modular defensive barriers and infrastructure

Technology Readiness Level (TRL)

Currently at **TRL 3–4**. The scientific foundation and formulation are validated through internal R&D and peer-reviewed material science. Prototype fabrication is planned to begin in Q3 2025, focusing on defense-grade and dual-use performance outcomes. Seshat Composites is seeking NATO-aligned collaborators and facility access to accelerate TRL advancement.

Market Outlook

The market for advanced materials, particularly those emphasizing sustainability and lightweight performance, is growing rapidly:

- **Hemp-Based Composites:** Valued at USD 8.01B and projected to reach USD 68.22B by 2030 (CAGR 35.8%)
- **Carbon Nanomaterials:** USD 5.83B in 2024, projected to reach USD 66.15B by 2034 (CAGR 27.5%)
- **Aerospace and Defense Composites:** USD 29.4B in 2024, projected to grow to USD 83.5B by 2033
- **Advanced Composites Overall:** USD 45.52B in 2024, growing to USD 99.51B by 2032 (CAGR 10.36%)

These sectors are strongly aligned with NATO modernization and green transition priorities.

Sustainability Statement

Seshat's Composites are made from carbon-sequestering industrial hemp processed via low-emission pyrolysis and cured with plant-based binders. The lifecycle—from crop to end-use—is designed to be climate-positive and circular, aligned with the UN SDGs and NATO's Climate Change and Security Action Plan.

Availability

Scientific formulation and material design are complete. Commercial fabrication begins Q3 2025. Samples, white papers, and MSDS frameworks are available upon request.

Submission Intent

Seshat Composites respectfully requests inclusion in NATO's Capability Statements Repository as a strategic candidate for future R&D, pilot testing, and dual-use defense partnerships.

Inventorship and Licensing

Seshat's Composites are the original invention of **Marie Seshat Landry**, a Canadian scientist, entrepreneur, and CEO of Seshat Composites. All intellectual and scientific rights are retained by the inventor.

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For inquiries about licensing, commercial partnerships, or collaborative development, please contact: marielandryceo@gmail.com.