



SUPPRESSION SYSTEMS MANUFACTURER
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APOKRISIS Capabilities Brief

MEMORANDUM FOR RECORD

FROM: APOKRISIS LLC

TO: Advanced Small Arms Procurement / Technology Acquisition Scouts

SUBJECT: Technical Capabilities Brief – Integrated Transpirational Cooling System (ITCS)

1. PURPOSE & DESIGNATION This document serves as a formal capabilities narrative for the Integrated Transpirational Cooling System (ITCS), an independent research and development platform engineered by APOKRISIS (Horn Lake, MS | FFL 07 / SOT Class 02). This technology holds official Patent-Pending status with the United States Patent and Trademark Office under **Application No. 64/061,875**.

2. CORE OPERATIONAL VULNERABILITY ADDRESSED Modern infantry, special operations forces, and crew-served weapons platforms face catastrophic signature risks and mechanical failures due to rapid thermal propagation. Traditional static baffle suppressors act as thermal batteries, radiating immense infrared signatures under FLIR/night-vision optics, accelerating barrel "droop," and inducing ammunition cook-offs during sustained firing sequences.

3. THE ITCS TECHNOLOGICAL SOLUTION The ITCS architecture replaces passive thermal mass with an active, multi-phase endothermic heat-management frontier. Nested entirely within a secondary expansion chamber outside the primary bore line, the system features a self-contained, dual-walled modular cartridge containing a sequestered, semi-permeable membrane and an aqueous or polymer-based ablative gel matrix.

- **Transpirational Phase-Change:** High-pressure propellant gas dynamics actuate the internal matrix, atomizing the cooling medium directly into the expanding gas stream. This captures the latent heat of vaporization at the core, preventing heat from radiating to the exterior chassis.
- **Pneumatic Scavenging Loop:** The extreme negative pressure differential (vacuum wave) generated immediately following projectile exit is harnessed to function as an automated pneumatic pump, drawing an aerosolized micro-mist of lubricant (e.g., LSA) back into gas-operated components to actively clear fouling and service the cyclic action.



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4. EMPIRICAL BENCH TESTING DATA Under rigorous live-fire evaluation using high-velocity, high-pressure rimfire baselines to simulate intense gas-velocity erosion and volume constraints, the ITCS platform demonstrated the following metrics:

- **Acoustic Attenuation:** Successfully achieved a sustained maximum sound pressure level of **72 dB** during an automated 30-round rapid-fire sequence on a 16-inch barrel platform.
- **Thermal Deflection:** Throughout intensive high-volume torture testing, the endothermic phase-change completely isolated the thermal frontier. The exterior housing of the manifold remained functionally cool to the touch, indicating near-total mitigation of outward infrared radiation.
- **Structural Integrity:** Advanced additive manufacturing utilizing a high-density, 8-wall monolithic carbon-fiber matrix (PAHT-CF) exhibited perfect concentric alignment with zero bore strikes, zero layer-line dilation, and zero media migration into the primary bore path.

5. ACQUISITION & INTEGRATION CAPABILITY As an independent, veteran-owned entity registered within the federal architecture (SAM.gov Active status), APOKRISIS owns 100% of the underlying intellectual property rights for the ITCS platform. The architecture is mathematically scalable to standard infantry profiles (5.56 NATO, .300 BLK, 7.62 NATO) and heavy automatic crew-served platforms.

APOKRISIS is actively seeking strategic partnerships, Cooperative Research and Development Agreements (CRADAs), and rapid-fielding contract pathways via USSOCOM and Army xTech pipelines to transition this technology into military centerfire production profiles.

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