

ANS PPA-3 / HETD — High-Energy Transient Defense (Structural Companion)

An armored frame graded to soak the blast and the pulse at once.

A rigid, load-bearing structural skin graded to absorb a physical blast and a high-energy electromagnetic pulse at the same time — built to survive extreme high-energy transients (EMP-scale and directed-energy pulses, pyroshock, hypervelocity impact), self-supporting without vacuum, and sealing the seams where energy leaks back in.

The armored frame that strengthens the pressure points: one rigid, load-bearing build that eases **both a physical blast and an energy pulse at the same time** — and seals the seams where energy leaks back in.

U.S. PROVISIONAL FILED — APPLICATION #64/086,584 · 9 JUN 2026

ENABLING DETAIL AVAILABLE UNDER MUTUAL NDA

■ Filed IP fact — as disclosed in the filed provisional ■ Engineered design target — projected from published, lab-validated building blocks (constituents at TRL 4–6); integrated-system test is the next step

① CO-DESIGNED DUAL-DOMAIN GRADIENT

- **One sub-layer stack grades BOTH** the mechanical/acoustic impedance and the electromagnetic impedance through its thickness — a single co-designed gradient, not two separate stacks.

Dissipates both a mechanical blast and an EM pulse in one co-designed gradient — mechanical and EM impedance graded together.

② SIMULTANEOUS MULTI-DOMAIN DISSIPATION

- **Absorbs a mechanical / blast / shock transient AND a high-energy EM transient** within a common, overlapping time window — both energies graded into a dissipative interior rather than reflected at an abrupt interface.

Absorbs a blast/shock transient and a high-energy EM transient in one overlapping window — graded into the interior, not reflected.

③ SELF-SUPPORTING STRUCTURE

- **Self-supporting: ≥ 50 MPa** interlaminar shear — holds its form under flight / vehicular / launch loads **without external vacuum hold-down** (design target).

Self-supports under flight/launch loads — ≥ 50 MPa interlaminar shear, rigid and load-bearing without vacuum hold-down.

④ APERTURE / SEAM CONTROL

- **Suppresses EM re-radiation through apertures, seams, joints, and fastener lines** via continuity **co-cured into the structure**; integrally-molded waveguide-below-cutoff depth-to-width $\geq 3:1$ (design target).

Suppresses EM re-radiation at seams, joints, and fastener lines — co-cured continuity, waveguide-below-cutoff depth-to-width $\geq 3:1$.

⑤ FORM FACTOR

- **Rigid, non-morphing, load-bearing chassis / airframe / spacecraft skin.** Embodiments include hypersonic leading-edge and submarine hull penetration.

Rigid non-morphing load-bearing chassis/airframe/spacecraft skin — hypersonic leading-edge and submarine-hull embodiments.

⑥ STATUS & IP

- **U.S. provisional FILED:** Application #64/086,584, filed 9 Jun 2026 (Conf. #3680). Companion to filed provisionals #64/020,126, #64/081,373, and #64/087,652 (ARI); uses those materials only as a constituent (no double-claim).

Filed structural companion — priority date locked 9 Jun 2026; pairs with the three filed companions, constituent-only, no double-claim.

- **Defensive scoping:** passive dissipation / suppression / impedance-matching only — no offensive EM, no biological-targeting (negative limitations in every independent claim).
Passive dissipation/suppression/impedance-matching only — no offensive EM, no bio-targeting; negative limitations in every claim.

WHAT PPA-3 / HETD ADDS — HETD is the structural companion to the filed ANS material patents: one rigid, load-bearing build whose single graded sub-layer stack eases both a mechanical blast and a high-energy electromagnetic pulse within the same time window, stands on its own without a vacuum crutch (≥ 50 MPa target), and seals the seams and openings where energy leaks back in. **FILED at USPTO 9 Jun 2026 as application #64/086,584** — the full four-application ANS portfolio is now on file.

Enabling material architecture & process detail available under mutual NDA. This page states *what* the structure is engineered to do, with design targets. It deliberately does *not* disclose the layer-stack recipes, gradient profiles, or process parameters — the proprietary *how*.

Non-proprietary technical overview — no NDA required to read this page. PPA-3 / HETD is FILED — U.S. provisional application #64/086,584 (9 Jun 2026). Architecture scoped as a passive / defensive, load-bearing structural member (no offensive EM function). All quantitative figures are engineered design targets projected from published, lab-validated constituent materials (TRL 4–6); integrated-system performance is not yet bench-tested; validation is the objective.

RACHAEL V HAGER DBA ANS COMPOSITE · CAGE 1ZST9 · UEI RK38AE8R1EP6 · SAM-active · micro-entity / woman-owned · contact@anscomposite.com