Boydd's Exoskeleton Retention System for Ballistic Shields: A Third Option.

By Boydd Products, 9-01-2025

In the evolving landscape of tactical gear, ballistic shields have seen steady advancements in materials, ergonomics, and modularity. The newest and most cutting-edge development is Boydd's **exoskeleton-based retention system.** This patent pending approach completely reimagines shield armor retention and how components are mounted, improving both performance and field serviceability.

What Is an Exoskeleton Retention System?

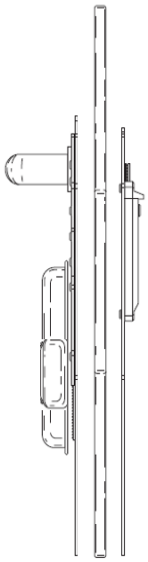
Frame Without Ballistic Core

Unlike conventional ballistic shield retention systems which either (1) bolt hardware directly through the ballistic resistant armor core or (2) suspend it within a sewn fabric weight bearing system, Boydd's exoskeleton shield frames offer a third, groundbreaking first-of-its-kind alternative. This innovative proprietary design utilizes an open two-piece perforated external frame system to partially secure the ballistic core while seamlessly integrating essential hardware and accessories. The system features perforate rigid front and rear frames, connected by external perimeter nylon fasteners, forming an open unified three-piece 'trifecta' assembly comprising the front frame, armor core, and rear frame.

The ballistic core remains intact and untouched by bolt penetrations, enhancing both integrity and modularity. The exoskeleton retention system and ballistic core can be manufactured in a variety of sizes and shapes.

Key Components

- **Front Frame Panel:**
  Provides an external face for mounting accessories like lighting systems, ID patches, or cameras. Along with the rear frame, it protects and reinforces the outer edges of the ballistic resistant core.
- **Rear Frame Panel:**
  Serves as the base for mounting the fixed handle, forearm brace system, and optional accessories. Ergonomically contoured for comfort and equipped with trauma-attenuating padding for added protection.
- **Ballistic Resistant Armor Core:**
  The rifle rated (RF1 or RF2) armor core forms the central component of the three-piece assembly. For color customization options, the armor core can be fully or partially jacketed with a colored non weight bearing nylon fabric or left unjacketed depending on user preference.



Three Piece Trifecta Assembly

- **Nylon Perimeter Fastening Straps:**
  Multiple external heavy-duty straps are passed through both frames and fastened tightly, distributing pressure evenly and securing the entire three-piece assembly. These straps are made from military grade webbing and feature double Velcro® adhesion.

Advantages of the Exoskeleton Retention System

🔧 No Ballistic Compromise

Traditional bolted systems require perforating the ballistic panel, which (while engineered for) can still marginally impact structural performance. The exoskeleton design leaves the core panel untouched, maintaining full ballistic integrity across the surface.

🧩 Modularity & Customization

Since accessories and carry components attach directly to the frame, users can rapidly replace, add or upgrade components without specialized tools, weaving through webbing, or clamping to the ballistic panel.

🪶 Weight Distribution

The external perimeter strapping system distributes retention forces evenly across the entire shield, greatly reducing stress on the rigid handle assembly. In contrast, handles that are bolted through shield armor can become compromised by direct ballistic impacts, potentially impairing their ability to support the armor's weight. Many sewn-on handle designs, meanwhile, have difficulty distributing load evenly during rapid rotational movement leading to noticeable shifting or lag at the attachment points depending on their specific construction.

🔁 Field Serviceability

Should a strap fray or a component become damaged, users can replace parts in the field without sending the shield back to the manufacturer.

🛡️ Edge Protection

The frame-and-strap assemblies provide a degree of edge and corner reinforcement giving the shield greater resistance to drops, abrasion, and environmental wear.

$ Long Term Savings

The components are modular, made in the U.S.A., and are easily replaceable without the high cost of replacing the entire shield.

Operational Benefits

- **Behind the Shield Trauma Reduction:**
  Engineered to reduce bone fracture risk and keep you in the fight. The rear frame paired with trauma attenuating padding greatly minimizes the risk of injury from backface deformation (BFD). In testing with 7.62x51mm M80 rounds at ASTM specified velocities, BFD measured less than 2mm at the point of contact with the user's forearm using Boydd® ABS-RF1 and ABS-RF2 ballistic resistant armor cores. This performance is well below the NIJ's 44mm threshold for torso-worn body armor. All BFD measurements were tested and verified by an NIJ-certified ballistic testing laboratory in the United States.
- **Stealth Movement:**
  External perimeter straps act as buffers and produce less noise when running walls, bumping obstacles, or setting the shield down which is ideal for stealth-based or tactical operations.
- **Improved Ergonomics:**
  Rear frames are designed with contoured trauma attenuating padding and an adjustable forearm brace allowing operators to fine-tune the fit based on carry preference. In addition, the left and right edges of the rear frame are reinforced for weapons manipulation. The patent pending front frame is integrated with two concealable weapons operations ports that extend, pivot and lock in place when needed.
- **Environmental Versatility:**
  The perforated frame system, moisture resistant armor jacket, and Boydd Line-X® sealed ballistic resistant armor core panels are ideally designed for performance in high moisture or corrosive environments.

Use Cases and Applications

- **Designed for Special Assignments or Patrol Units** requiring a lightweight, quick-deploy solution adaptable to personnel of diverse sizes and strength levels.
- **Maritime or humid climate operations** where rust or moisture damage is a concern.
- **Training units** where shields are frequently modified, adjusted, or shared among users.
- **Ideal for agencies focused on shield longevity**, reducing long-term wear on the ballistic core panel, and favoring easy component replacement over full shield replacement to lower overall lifecycle costs.

Conclusion

Frame With Jacketed Ballistic Core

Boydd's patent pending exoskeleton retention system marks an all new and significant step forward in ballistic shield design. By decoupling the mounting hardware from the ballistic core and by eliminating the use of weight bearing fabric enclosures this innovative approach offers a third design option while supporting rapid field adaptation. Whether in urban tactical units, military deployments, or high-risk patrol operations, Boydd's trifecta approach with open perimeter secured exoskeletal frames offer a compelling balance of protection and practicality.

About Boydd Products:

Boydd Products, Inc. is emerging as a leading innovator in armor support systems dedicated to improving performance, safety, and reliability for professionals in high stress environments. With a focus on practical design and improved features, Boydd Products delivers advanced solutions that address real world challenges and enhance survivability under extreme conditions. Inspired by a recent life saved, retired Police Sergeant Jim Boydd continues to lead the charge in new product innovation. If you want to learn more, contact Boydd Products or visit www.boyddproducts.com or www.advancedballisticshield.com