



## Lightweight Ceramic Body Armor

### Background

Most US and Canadian infantry personnel are issued two protective ballistic armour plates to protect against small arms (rifle) fire. These plates are intended to be used in conjunction with a soft armour (typ. Kevlar® or Dyneema®) vest. New armor piercing bullets, incorporating high strength core materials (e.g. M993 7.62mm), can defeat most of the existing body armour available in today's market.

### Description of the invention

A new hybrid ballistic armor system has been developed to address this next generation high-performance armor-piercing threat. The proprietary feature of this system is the addition of a formed metallic layer to the typical ceramic and composite layers normally used in conventional body armor.

The metallic layer serves to reinforce the ceramic, provide an impedance match against the ceramic backface, increase the confinement of the pulverized projectile/ceramic debris, and better distribute resultant forces over the composite backing layer.

### Advantages

The primary advantage of the new system is that it allows for a reduction in the thickness and weight of armor required to address a given projectile / threat level.

Enhanced protection is provided via a reduction in back face signature and reduced potential for blunt trauma.

Manufacturing advantages of the new system include the use of a thinner ceramic layer as well as the potential to use lower cost ceramics.

For a given threat level, the system provides the lowest areal density/plate weight available today.

### Potential applications

The new hybrid armor system is a platform technology that can be scaled/tuned for numerous applications including:

- Body armor – including NIJ level III+, IV (ESAPI), IV+ (XSAPI).
- Protection against large projectiles .50+ cal.
- Light armored vehicle/aircraft/Humvee protection.
- Driver/pilot protection (seats etc.).
- Protection of critical vehicle systems (controls, electronics)

### Reference

10126

### Inventor(s)

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### Patent status

US and Canadian patents granted

### Stage of development

Advanced Prototype

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