



HybridTech Armor®

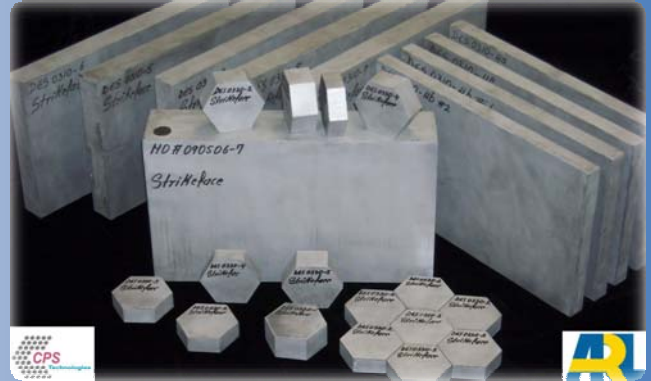
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CPS HybridTech Armor®

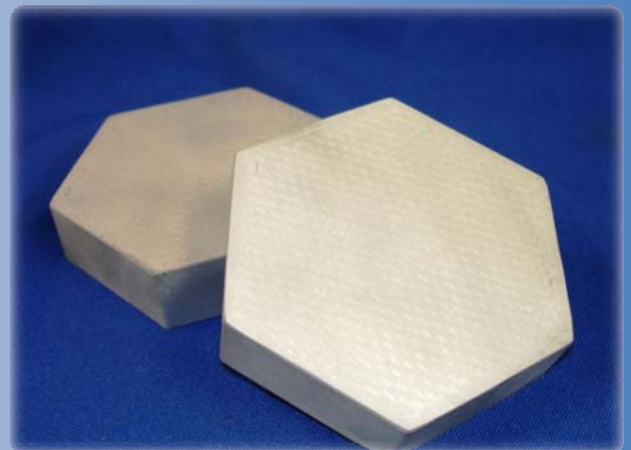
- MMC Encapsulated Ceramic Armor
 - Aluminum or aluminum metal matrix composite (MMC) encapsulating layers
 - Outgrowth of CPS' world leadership in MMC production – tens of thousands of parts per week
- Improved Toughness
 - Reduce collateral damage
 - Tough enough for load-bearing drilled holes
 - Bond between ceramic and MMC survives ballistic impact
- High Stiffness
 - Improved support for ceramic tiles
 - Reduced panel bending
- Compressive Stress in Ceramic Tiles
 - Shrinkage of metal and MMC encapsulant puts ceramic tiles into compression
- Individual Tiles or Large Arrays
 - Individually encapsulated tiles for integration into arrays
 - Large one piece panels containing an array of ceramic tiles. Up to 2 x 3 feet (600 x 900 mm) currently, with 3.5 x 4 feet (1000 x 1200 mm) soon

Applications

- Individually encapsulated and toughened tiles for conventional integration
- Complete, metal or MMC encapsulated armor panels
- Special Modules which are structural, such as hatches or doors



Manufacturing Development Sponsored by Army Research Lab
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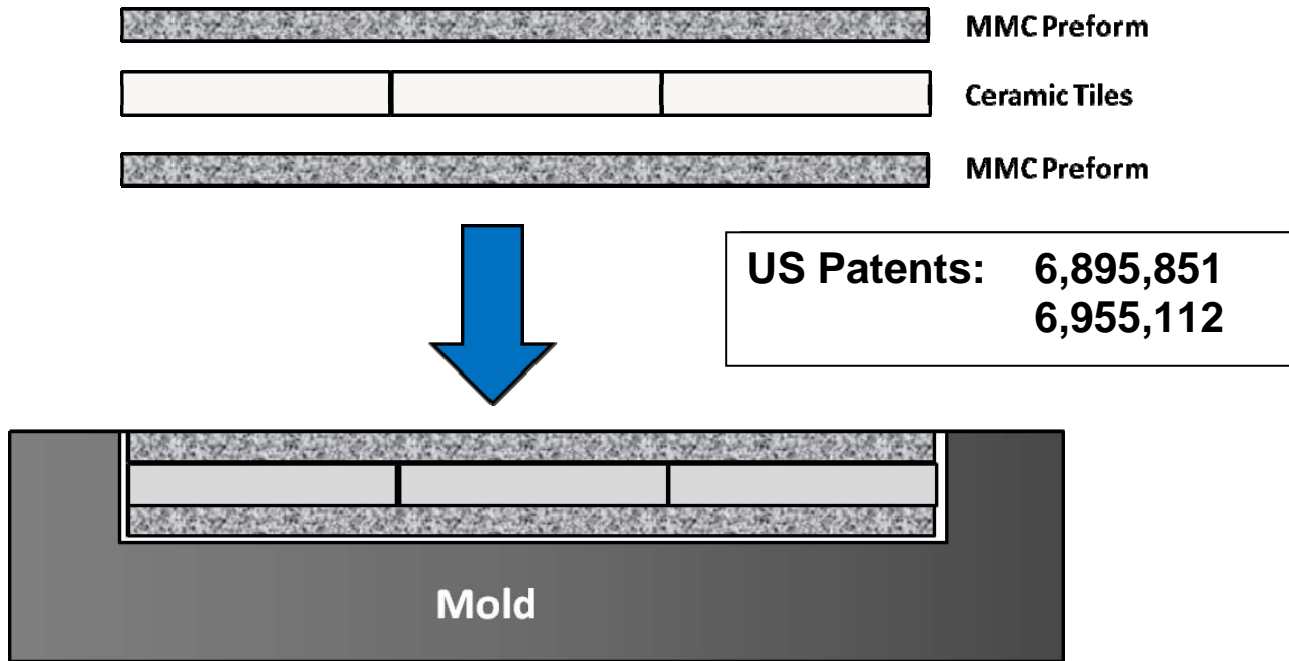




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CPS HybridTech Armor® improves the toughness of ceramic tiles in composite armor systems by selectively reinforcing them with metal and metal matrix composites (MMC) and then packaging them in a hermetic layer of high-pressure cast aluminum.



The technology for these new tiles and modules is an outgrowth of CPS' World leadership in metal matrix composites (MMC). The Hybrid Ceramic Modules use an innovative combination of materials to encapsulate the monolithic ceramic tile (or array of tiles) and then integrate it into a hermetic package by infiltrating with aluminum at high pressure. The resulting modules are stiffer in bending, have an intimate chemical/mechanical bond between the ceramic and encapsulating material, and have residual compression in the ceramic due to the differential coefficients of expansion.

CPS is a world leader in developing and manufacturing advanced materials solutions and products, particularly combinations of metals and ceramics, to improve performance and reliability of applications in a variety of end markets. Our primary product is silicon-carbide particle reinforced aluminum (AlSiC) for thermal management of electronics. CPS AlSiC products are used, for example, as heat spreaders in microelectronics and as baseplates for high power motor controller packages, as well as many other applications.

