



# Vehicle Armor Systems

Ceradyne provides DEFENDER® vehicle armoring systems that encompass the latest protective products for tactical wheel and logistical support vehicles. These armor solutions use an array of advanced armor materials combining metals, ceramics and composites to provide a system solution that meets warfighter needs and defeats threats that are most prevalent on the battlefield. These advanced technology systems are flexible, adaptable and responsive to local threat requirements allowing fast and effective adjustments to armor protection levels and enhanced survivability.



## Ceradyne Armor for Lightweight Tactical Vehicle Systems

In the light vehicle armor arena, Ceradyne is working with FLYER LLC who has a light strike vehicle that is of great interest to SOF. Ceradyne has designed and fielded enhanced light armor protection for this vehicle that allows it to operate with the CV-22 and other helicopter lift assets. The lightweight armor also retains the inherent speed, mobility and agility of the vehicle that has just returned from a round of international reviews by interested SOF forces.

Ceradyne works closely with other OEMs to provide tailored solutions for light tactical vehicles allowing vehicle designers to take maximum advantage of limited weight carrying capacities while providing maximum survivability for vehicle operators.

Ceradyne Vehicle Armor Systems located in Wixom, Michigan, works directly with vehicle OEM's to provide advanced armor solutions in response to government requirements. The facility

is optimized to provide engineering services, prototyping and light manufacturing in support of development programs.

## Combat Vehicle Armor

The BULL advanced-technology armored solution is a fully integrated armored vehicle design. It takes advantage of advanced armor technology and modular design to provide protection beyond MRAP vehicle capabilities. The BULL design has been subjected to, and has withstood, some of the most severe threats faced by US military forces in conflict today, the Explosively Formed Penetrator ("EFP Resistant").

Ceradyne has developed lightweight EFP defeat systems that are certified by the USG and ready to deploy on vehicles with increased weight carrying capacity to provide a guaranteed level of protection against the most lethal threat on the modern battlefield.

## RAMTECH<sup>2</sup>™ Modular Armor

RAMTECH<sup>2</sup> is a highly engineered, fully integrated, modular armor and blast protection system that utilizes a variety of advanced lightweight materials for direct application on tactical wheeled vehicles. RAMTECH<sup>2</sup> materials meet or exceed the threat level protection requirements specified in the US Army's Long Term Armor Strategy [LTAS] and NATO STANAG 4569.

RAMTECH<sup>2</sup> incorporates ceramic, metal and composite materials for a ballistic solution that provides excellent multi-hit performance similar to metal but at a fraction of the weight. This versatile, lightweight technology provides a wide range of solutions for any combination of threat level requirements.





## Vehicle Armor Systems

Ceradyne modular armor complies with most current requirements of Standard NATO Agreement 4569 [STANAG] as well as domestic protection level ratings such as NIJ and UL. In addition to providing direct fire ballistic protection, Ceradyne's comprehensive solutions include blast protection for both contact detonated and command detonated mines. Vehicle wheel well and underbelly protection designs, available through our dedicated facility at Ceradyne Vehicle Armor Systems, can be integrated into the vehicles overall configuration to insure the survivability of crew members.

In conjunction with its RAMTECH<sup>2</sup> armor, Ceradyne now offers advanced underbelly blast mitigation systems designed in cooperation with CMI. These systems are customized to meet specific vehicle / threat requirements and have demonstrated the ability to increase vehicle survivability from underbelly attacks over conventional "V" bottom designs.

### Commercial Armored Vehicles

For personal vehicles and limousines that require added ballistic protection, Ceradyne offers a range of DEFENDER<sup>®</sup> opaque armoring options including composite, steel-composite, and ceramic-composite components. Custom material solutions meet protection level standards including NIJ, UL, and NATO. Ceradyne tailors a solution package to meet customer requirements for protection, space allocation, weight and cost.

Ceradyne now offers complete armored vehicle solutions to meet the needs of Homeland Security and special law enforcement agencies. Ceradyne has also developed an after market application for police cruisers that provides local and state police with enhanced levels of protection for law enforcement personnel while sitting in their cars or engaging threats while on the move.



F-Series Armored Truck

### Advanced Armor Technology

Ceradyne is a vertically integrated manufacturer of raw powders, sintered and hot pressed ceramics and patented armor technology. Whether it is body armor plates with compound curvature, tile products for mosaic armor construction, or large plates for panel systems and aircraft armor, Ceradyne's advanced ceramic materials are the foundation of the worlds lightest armor systems for small and medium caliber protection.

### Ballistics Testing

Ceradyne utilizes its own ballistic range to test materials and armor designs against a full spectrum of ball and armor piercing threats from 5.56 to 12.7 mm.

The ceramic strike-face of a lightweight armor system shatters the bullet on impact. The effectiveness of ceramic is enhanced by a metallic or composite backing layer that provides structural support and absorbs residual energy. Properties of high hardness and strength, together with low density, impart the unique efficiency of ceramics as a principal component of advanced armors.



**Corporate Office**  
3169 Red Hill Avenue  
Costa Mesa CA 92626 USA  
Tel (714) 384-9483  
Fax (714) 549-5787  
armor@ceradyne.com  
[www.ceradyne.com](http://www.ceradyne.com)

**Vehicle Armor Systems**  
50370 Dennis Court  
Wixom, MI 48393 USA  
Tel (248) 960-9339  
Fax (248) 960-9338

#### Lifesaving Materials and Technology

Ceradyne, Inc. (NASDAQ:CRDN) is a publicly traded corporation specializing in the development and production of advanced ceramic materials. Worldwide vertically integrated manufacturing facilities produce advanced ceramic solutions for the most demanding applications in automotive/engine, industrial wear, medical, electronic, and defense industries. Since the earliest use of ceramic armor on combat helicopters, Ceradyne has supplied government and industrial armor developers with the materials and technology for advanced ballistic protection. Ceradyne is a worldwide leader in the development and integration of light armor technology.



8/09