Kinetic Energy Threats Against Ceramic Armor

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ABSTRACT:

Steel has long been one of the best armors for stopping kinetic energy threats. However its performance is marred by its high weight. When steel is put on vehicles it is often to heavy and decreases mobility. The solution is to turn to armor that incorporates hardened ceramics. These hardened ceramics are much lighter than steel and much harder, though brittle. The penetrator strikes the ceramics and it simply shatters. Thus the problem is creating an armor that supports the ceramics so they remain rigid and do not shatter when the initial wave of the bullet passes through the material. Two ways of supporting the ceramics were tried. First, layers of woven materials in various configurations were put behind the ceramics to support them. The second option was to encapsulate the armor in metal and have a metal backing as the supporting element. In this presentation I will show how and why different combinations of materials performed better than others while keeping the weight of the armor under a certain limit.

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