

Sentinel armour



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Background

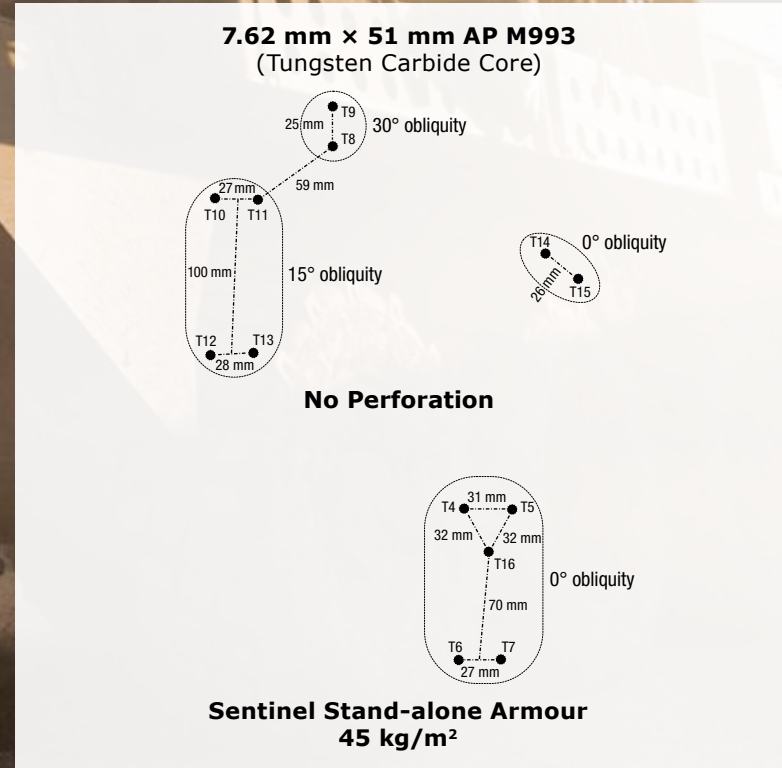
Add-on armour made with a ceramic strike face assembled in a mosaic of tiles has a high cost of assembly. Additionally, special care is required to avoid weak zones between tiles or at the edges of the armour. Moreover, these types of ceramic mosaics, as well as most add-on armours, are optimized to defeat specific projectiles with limited capabilities for defeating other threat types.

Collaboration

DRDC Valcartier and NRC worked together to solve the challenge of developing a **new concept of armour without using a conventional armour design** (i.e. mosaic of ceramic tiles) to increase **multi-hit capability while maintaining a similar weight to commercially available add-on armour systems**. Other mandatory objectives were to **reduce cost and be optimized for all threat types** (i.e. EFP, FSP, KE steel and tungsten core, blast, etc.) rather than for a specific threat type. No constraint was put on the thickness of the armour, in a first step, to avoid neglecting any potential armour solutions.

Results

A first prototype was developed in 2017. The first tests focussed on the capability to defeat a tungsten core projectile (i.e. 7.62 mm x 51 mm AP M993) fired at different velocities and elevations. Tests were performed with a 45 kg/m² standalone armour. All shots, even those in close proximity, were stopped and the target was still in very good condition (see T4, T5 and T16 roughly 32 mm apart from each other and T4-T5 was 98 mm away from T6-T7). **So far, results show a product four times more efficient than Rolled Homogenous Armour (RHA) steel in terms of weight.** Future tests will focus on reducing the weight and thickness.



Yaw card in front of the 20 in x 20 in target

Significance for military forces and civilian companies working on security

Light, low-cost, robust, multi-role and multi-hit stand-alone armour is under development. This armour features a **higher multi-hit capability**, a **higher multi-thrtility** than conventional mosaic ceramic armour systems. Finally, a **lower cost is expected from this new technology** compared to conventional armour systems.

Shot Number	Obliquity of the target (°)	Impact velocity (m/s)	Distance from previous (mm)	Result
T4	0	929	–	Projectile stopped
T5	0	946	31 mm from T4	Projectile stopped
T6	0	919	98 mm from T4-T5	Projectile stopped
T7	0	930	27 mm from T6	Projectile stopped
T8	30	929	–	Projectile stopped
T9	30	922	25 mm from T8	Projectile stopped
T10	15	936	78 mm from T8-T9	Projectile stopped
T11	15	903	27 mm from T10	Projectile stopped
T12	15	910	100 mm from T10-T11	Projectile stopped
T13	15	932	27 mm from T10	Projectile stopped
T14	0	880	–	Projectile stopped
T15	0	761	26 mm from T14	Projectile stopped
T16	0	932	32 mm from T4 and T5	Projectile stopped

For more information about the Sentinel armour

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