Advanced protective materials

Lighter and more resistant materials for enhanced protection

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ISL develops **novel protection materials** and **armour systems** in order to:

- **improve ballistic protection** for soldiers and light armoured vehicles
- **reduce the weight of structures**
- **improve** the intrinsic **characteristics** of materials (composition, micro-structure, reinforcement, etc.) adapted to specific demands.

Ultrafine powders metallurgy and sintering allows the manufacturing of micro- and nanocomposites mixing **metals** and **metallic alloys**, **ceramics** and **polymers**, also in multilayer and particle reinforced **composites**.

Materials with **enhanced ballistic performance** can be produced, based on the understanding of the **characteristics of materials** and the capacity to design **customised** composites:

- **characterisation** and **modelling** of the mechanical behaviour of protection materials under dynamic stress conditions
- **identification** of behaviour and destruction laws in order to **predict the behaviour** of these materials when impacted
- **tests of materials** subjected to **ballistic impact**

Examples

- High-performance multilayer polymer/metal composites with features gradient
- Light particle-reinforced metallic alloys (aluminium, magnesium, etc.)
- High-resistance, high-stiffness, low-weight transparent ceramics

Applications

- Enhanced ballistic protection of airborne, naval, ground and security forces
- Lighter individual equipment and mass reduction of materials
- Lighter windscreens for armoured vehicles

ISL – French-German Research Institute of Saint-Louis

5 rue du Général Cassagnou • 68301 Saint-Louis • France