

New Bulletproof Fibre Stronger and Thinner than Kevlar

Kevlar has been in use for decades, making bulletproof vests and armoured vehicles. A new composite material that is stronger, tougher and better at stopping bullets than Kevlar, even though it is much thinner. To stop high-speed impacts, like a bullet, a material needs to resist breaking under force (high strength) and be able to absorb a lot of energy without shattering or failing (high toughness).

Kevlar, which is made from aramid fibres, cannot be made stronger, as they often become more brittle, making it difficult to achieve both simultaneously. Now, scientists from China (Jin Zhang from Peking University and his colleagues) have created a new type of fibre by combining a heterocyclic aramid, a high-performance fibre similar to Kevlar, and treating long carbon nanotubes.

The scientists subjected their new material to high-speed tests, including ballistics tests similar to those used for body armour. It achieved a dynamic strength significantly higher than existing fibres, and its ability to absorb energy more than doubled the previous record, reaching 706.1 megajoules per cubic meter. When woven into a fabric, this new super-fibre showed superior anti-ballistic performance compared to current protective fabrics. (Source: *Matter* (2025). DOI: 10.1016/j.matt.2025.102496).