New strategically important hard metal developed in Finland

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Over the past three years VTT Technical Research Centre of Finland has been working with Finnish-based Exote Ltd to develop a new hard metal and the necessary manufacturing process. This material can be used to replace tungsten carbide (WC), the hard metal widely used in industry today and whose global availability is becoming critical. The new material also possesses excellent bullet-proofing qualities, and ballistic tests has proved its unequalled ability to stop armor-piercing bullets.

The hard metal known as WC Co – used commonly in industrial applications demanding strength and durability – contains tungsten carbide and cobalt, both of which are defined by the EU as critical and, in the case of cobalt, dangerous to health. The EU critical materials list contains substances of significance to the EU economy but whose availability is at great risk, and are mostly non-renewable. Exote's material is a more ecological alternative, the new manufacturing technology enabling comparable properties to be acquired from other raw materials.

Exote's material withstads high temperatures and has high-level strength and durability. The metal is ideal for the manufacture of crusher blades and shear cutters, as well as exacting product tools. In ballistic protection it can be used to both personal- and vehicle protection. Especially at the highest Nato defined protection levels the material has been proved to be superior . The growing threat of roadside bombs, grenade splinters and armor-piercing bullets can now be reduced by solutions based on this new material.

VTT and Exote Ltd carried out further development on the material Exote has in production through the use of nano additives, which enable changing its toughness and hardness according to intended use.

The market potential for this new material is huge, and it will be important in many applications especially within the EU area.

Provided by VTT Technical Research Centre of Finland