Final meeting of the OB study 'Graphene in Defence'

The final meeting of the EDA study on "Graphene for defence" took place on 8 March 2019 in Brussels. The project coordinator, TECNALIA, together with the two subcontractors, Cambridge Nanomaterials and University of Cartagena, presented the main outcome of this work.

Graphene presents unique properties which make it attractive for several defence applications:

- Electronic and optoelectronics
- Flexible systems
- Energy
- Ballistic protection materials
- Multifunctional coatings
- Camouflage and signature management coatings
- Filters and membranes
- Sensors
- Biomedical applications
- Energetic materials

Roadmaps for the main defence applications and products where graphene provides a competitive advantage have been analysed. The activities that support this analysis are the following: an on-line survey, a dedicated workshop and interviews with stakeholders in graphene and/or defence sectors. Other inputs to the roadmaps came from the state-of-the-art analysis and experimental assessment carried out by the partners. As a result of these tasks, qualitative and quantitative data was obtained on:

- the timeframe in which the developments of products based on graphene for defence can be completed
- the investments needed to reach pre-commercialization for the different applications selected
- the military relevance of those key applications.

An analysis crossing all these inputs with the set of Generic Military Tasks Level (GMTL), related to the Capability Development Plan (CDP) priorities with relevance to the Materials & Structures domain was performed, with specific products/applications highlighted considering their relevance to defence. For the selected products, a SWOT (strengths/weaknesses/opportunities/threats) analysis was completed taking into account the most

relevant public information such as scientific papers, projects and patents as well as the experimental assessment carried out along the project.

The unique properties of graphene are promising for specific defence products and an important impact is forecasted for some of them, such as thermal camouflage, ultrasensitive CBRN sensors or vests with enhanced ballistic properties. The key to success lies in mastering the step from "proof of principle" to actual mature demonstrators prepared with commercially feasible processes. This demands further material understanding but also engineering to show the potential in relevant defence environments allowing a reasonable comparison to competing or state of art technologies in terms of performance and cost/benefit.

Deliverables in final version will be available soon, they are now under the final review stage.
