

A Seminar on Bulletproof Fiber Materials by the DTU Faculty of Civil Engineering

On December 30th, 2015, Duy Tan University held a seminar on “Advanced Methods for the Determination of Mechanical behavior of Fiber materials under Ballistic impact”, which was attended by Dr. Ha Minh Cuong of the École Normale Supérieure de Cachan in France and by lecturers and students of the Faculty of Civil Engineering.



Dr. Ha Minh Cuong presents his research

Nowadays, the manufacture of bulletproof vests to protect armed forces or security personnel policing riots or fighting terrorism is of increasing importance internationally. Bulletproof fiber materials are improving, with higher durability than steel. They resist penetration but are still more convenient, comfortable and less heavy for their wearers.

Dr. Cuong has many years of experience researching bulletproof fiber materials and gave a comprehensive presentation. His research is part of the EPIDARM project of the European Defense Agency, concerning the impact of bullets on 2D and 3D materials and involves three areas of study, experimentation, data gathering and analysis. The experiments were conducted at the Belgian Royal Military Academy in Brussels using air compressor guns and equipment that determines bullet velocity and textile deformation at the moment of impact.



Staff, lecturers and students of the Faculty of Civil Engineering

According to Dr. Ha Minh Cuong, the initial choice of a fabric and its advantages in stopping bullets is the first important step. Bulletproof vests designed with many layers are able to reduce the penetration power of sharp bullets, giving multiple-layer protection and are heavily used today.

“Experimentation, numerical simulations and analysis give us a clearer understanding of the structural durability of fiber materials, from a 2D and 3D viewpoint. We have modeled the destructive process of bullets, which allows us to predict the deformation using basic parameters during impact in real-time,” explained Dr. Cuong. *“We can compute the residual speed and the penetration limit of these materials. Determining the ballistic destruction frequency, deformation capability, and energy absorption capability of bulletproof materials are some of the fundamentals in our search for the best linear elastic materials to protect human lives.”*

Dr. Cuong’s presentation was received with interest and a lively discussion ensued. This research on advanced methods to determine the mechanical behavior of fiber materials lays an important foundation for the improvement and optimization of materials for advanced bulletproof vests. In the future, we will be better protected and offered a wide range of protection, allowing lightweight ease of movement, whilst minimizing damage from all types of weapons.

(Media Center)